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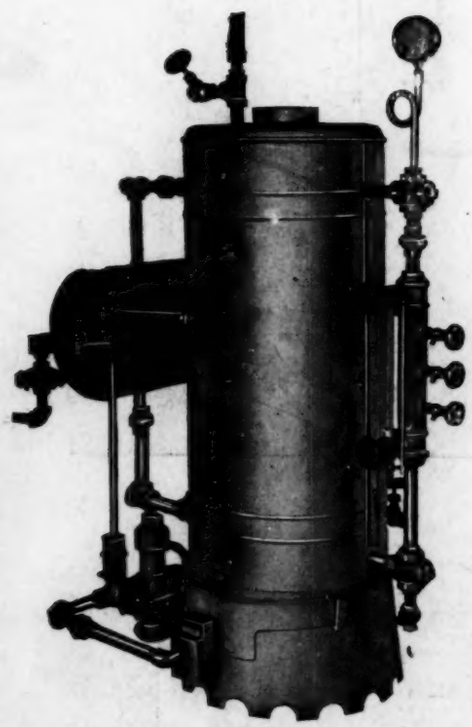
PROFIT IN NEW BUSINESS



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Nyack-on-the-Hudson **New York**

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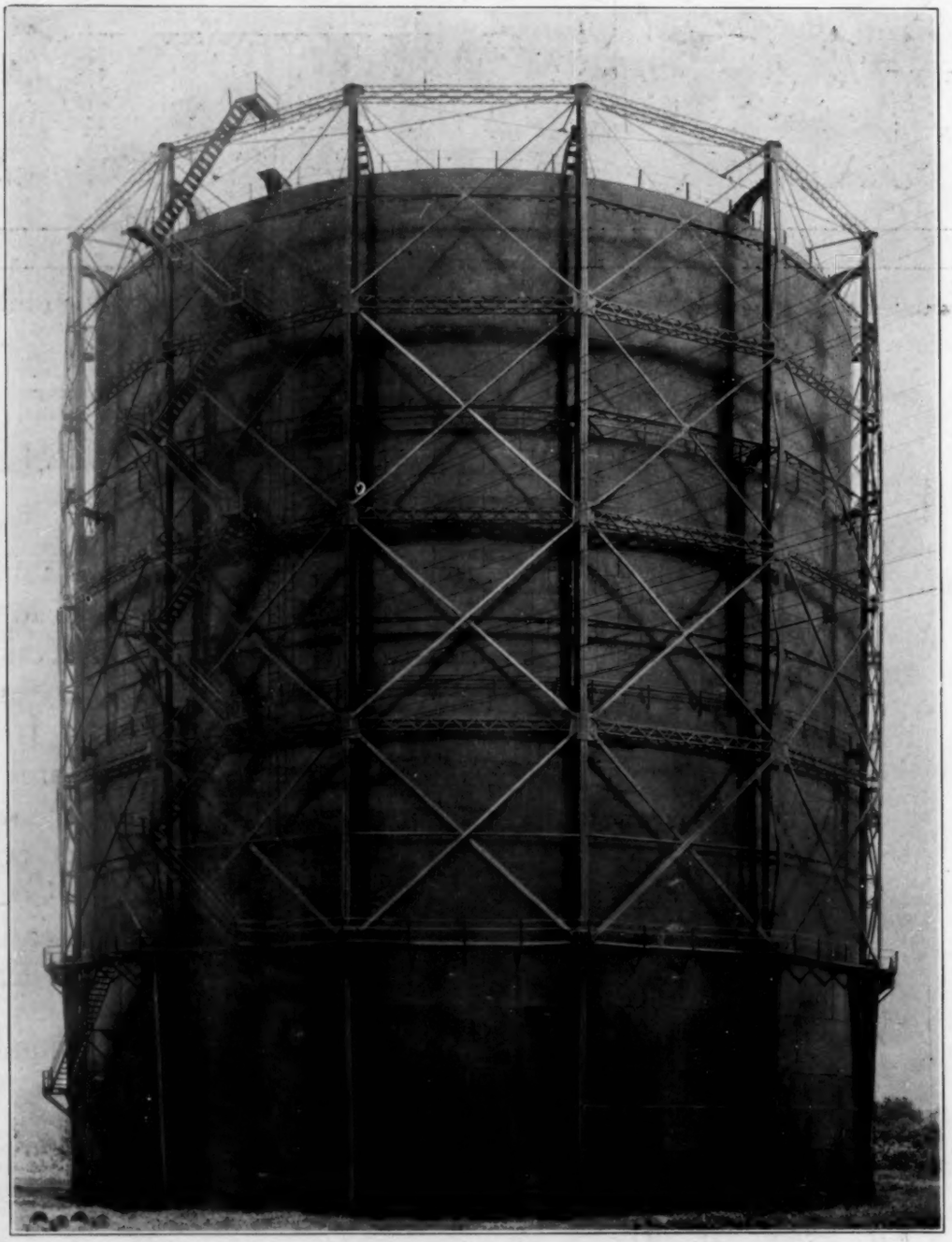

Bulletin J-240

BUILT BY

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Fort Wayne, Indiana

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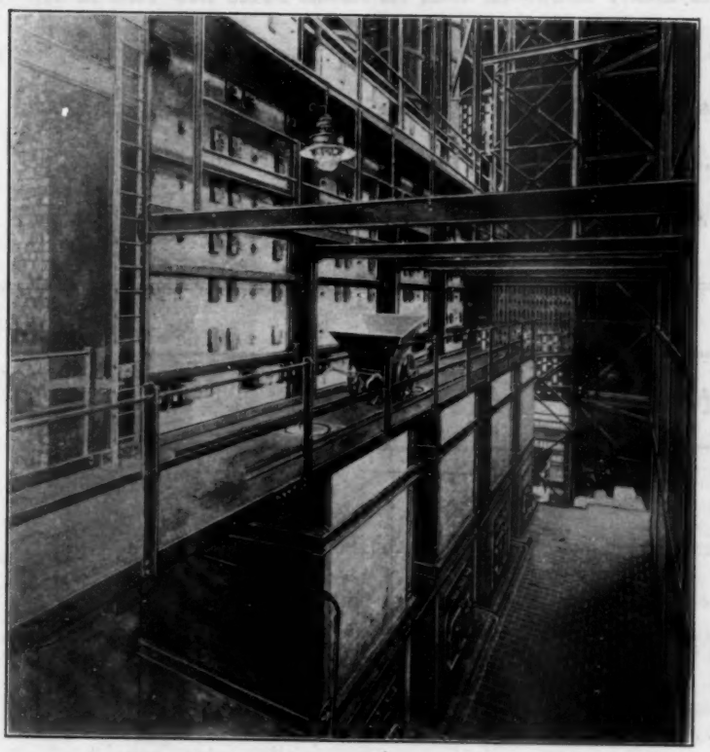

View Showing Producer Side of Retort Bench

Illustration shows Horizontal Combustion Chamber Damper Boxes and Individual Bench Producers.

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of America, Inc.
150 Nassau St. New York

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

American Gas Journal

SIXTY-THIRD YEAR

Published Weekly by AMERICAN GAS LIGHT JOURNAL, INC., 150 Nassau Street, New York, N. Y.

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Western Office, Peoples' Gas Building, Chicago, Ill.—Roy W. Brown, Manager
Harrison 5938

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American Gas Journal
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Vol. 116, No. 3 NEW YORK, JANUARY 21, 1922 Whole No. 3233

Continuous Water Gas Producer

Advantages Claimed for It Over Intermittent Type

By A. W. H. GRIEPE

The advantages of the continuous water gas producer over the intermittent type of producer are many, but only a few shall be enumerated:

Continuous flow of gas
Uniform quality of gas
Continuous operation of producer
Clean gas
Reduction in operating cost

The simplicity of the apparatus is apparent. It consists of:

Producer shell
Hot plate
Combined coal and steam nozzle
Gas burners
Boiler

The producer operates as follows: In a producer shell of standard dimensions is placed a hot plate, which is kept hot by external means (in this instance by five gas burners). The steam from nozzles forces the powdered coal and steam onto the hot plate, the carbon is ignited and decomposes the steam into H_2 and O_2 and the reaction is assisted by the heat from the plate.

The hot gases leave the gas burner chamber and pass through the boiler.

The gas is produced in a closed vessel, without coming into contact with the atmosphere, thus producing a uniform quality of gas.

Any grade of powdered coal can be used—even lignites, pea, lampblack, can be made use of, thus opening up a new field to gas companies.

The operation of the apparatus is very simple. The gas burners are started, the plate is heated and the valve operating the nozzles is opened, forcing the mixture of coal dust and steam against the plate, thus starting the operation. No additional operation is necessary except to see to it that enough powdered coal is carried with the steam at the ratio of 3 to 2.

Operating Data, Based on the Following

One pound of carbon liberates 4,430 B.t.u.

One pound of carbon needs 1.33 lb. of oxygen.

Amount of steam containing 1.33 lb. of oxygen 1.445 lb. or approximately 1.5 lb.

6,900 B.t.u. are necessary to decompose steam into H_2 and O_2—1.5 lb. of steam need 10,350 B.t.u.

One pound of carbon liberates 4,430 B.t.u., so (10,350 — 4,430) = 5,920 B.t.u. have to be added for complete decomposition. Now 1.5 lb. of steam at 150 lb. pressure and 50 deg. superheat contain 1,195 + 597 + 65 = 1,852 B.t.u.

The total B.t.u. to be added is therefore 5,920 — — 1,852 = 4,072 B.t.u.

This amount of heat has to be added to the gas by the five gas burners located under the hot plate.

The gas produced has 300 B.t.u., assuming 75 per cent efficiency of heating apparatus: the necessary amount of gas to heat hot plate therefore is:

$$4{,}072 \div 300 \times 0.75 = 18 \text{ cu. ft.}$$

Eighteen cubic feet have to be deducted from the capacity of the producer to arrive at the net output. The amount of gas produced from one pound of carbon and 1.5 lb. of steam is:

CO	= 28:12 — 2.33 lb.	31.8	cu. ft.
H_2	= 1: 9x1.5 — 0.166 lb.	31.0	cu. ft.
CH_4	=	0.5	cu. ft.
O_2	=	0.01	cu. ft.
CO_2	=	0.3	cu. ft.
Total gas produced		63.61	cu. ft.

Quality of gas in percentage by volume:

H_2	CO	CH_4	O_2	CO_2
48.53%	50.2%	0.785%	0.015%	0.47%

Net output of producer therefore is:

$$63.61 - 18 = 45 \text{ cu. ft.}$$

from the above necessary amount of coal and steam per thousand cu. ft. (MCF) is:

Coal — 22 lb.
Steam — 33 lb.

$$365 + 50 = 415 - 70 = 345 \text{ deg.}$$
for 1.5 lb. of steam = $345 \times 1.5 = 517$ B.t.u.

Temperature of gases leaving producer gas chamber, 1,000 deg. Fahr.

Temperature of hot plate 1,800 deg. Fahr.

Continuous Water Gas Producer—Capacity 20 MCF Per Hour

Producer shell—5 ft. 6 in. diameter, 14 ft. high.
Coal— 440 lb. per hour.
7.33 lb. per minute.
Steam—660 lb. per hour.
11 lb. per minute.
Water—2 grams.
Gas for heating—360 cu. ft. per hour.
60 cu. ft. per minute.

Size of steam nozzle:
660 × 2.69 = 1,665 cu. ft. per hour
27.7 cu. ft. per minute.

Diameter of nozzle:
27.7 :132 = 0.209 sq. in. = 17/32″ diameter.

Boiler:
5 lb. of water evaporated per sq. ft. of heating surface per hour:

H.S. = 660 ÷ 5 = 130 sq. ft.

Superheater = 14 sq. ft.

Boiler made up of 208 ft. of 2 in. pipe.
Superheater 23 ft. of 2 in. pipe.

Producer gas outlet, 16 in. diameter.

Cost of Manufacturing 1,000 cu. ft. of Water Gas of 300 B.t.u.

Pulverized coal to be used:

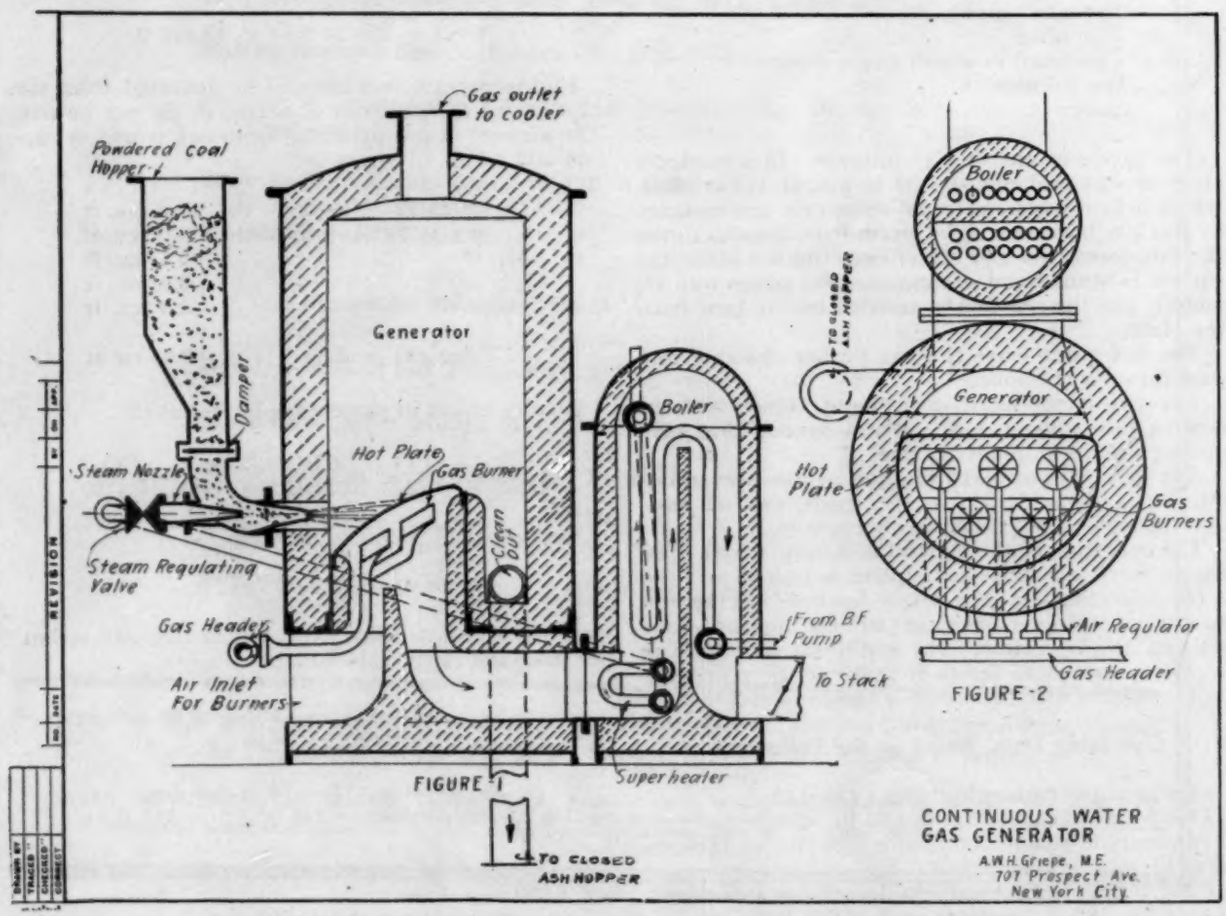
Coal per ton		$5.50
Drying per ton:		
Moisture loss	$0.25	
Labor	0.06	
Power	0.05	
Fuel	0.04	
Superintendence	0.03	
Depreciation	0.07	
		0.50
Pulverizing per ton:		
Labor	$0 22	
Power	0.07	
Depreciation	0.11	
		0.40
Total cost of coal per ton		$6.40
Total cost of coal per pound		0.0032

Twenty-two pounds of coal used per MCF—7.04 cents.

Water

Cost—$1.00 per 1,000 gal.
Price per pound—13 cents.

(*Continued on page* 66.)



Slow Cooling of Coke

Tests Made with a Coke Cooling Installation

Translated and adapted from the original Swiss article in "Monats Bulletin," No. 9, 1921.

By ISMAR GINSBERG, B.Sc., Chem. Eng., Associate Editor

In the opinion of the editor the value of this article lies in the fact that it exposes a practical means of utilizing the great amount of heat that now goes to waste in the regular by-product coke oven plant, in the form of glowing coke which, as is well known, in general practice is dumped out of the retort and extinguished with water. The apparatus in question can be installed in any plant, as it forms merely an adjunct thereto and does not necessitate any great fundamental change in the existing installation. The question whether a greater price could be obtained for coke that was made in this manner would depend largely on the proof that the extra cost of the same would be more than counterbalanced by the saving in the quantity that would have to be used to obtain the same results as when moist coke was employed and that other advantageous results would be attained likewise. As far as the steel plant is concerned, that is the plant which possesses its own coke oven installation, it would appear well worth while to give the matter careful study and attention, as in this case the plant would benefit not only from the utilization of heat, which is now generally going to waste, but also from the production of a coke, that would produce a greater heat in the blast furnaces, and a gas of greater calorific power in the producer gas generators.

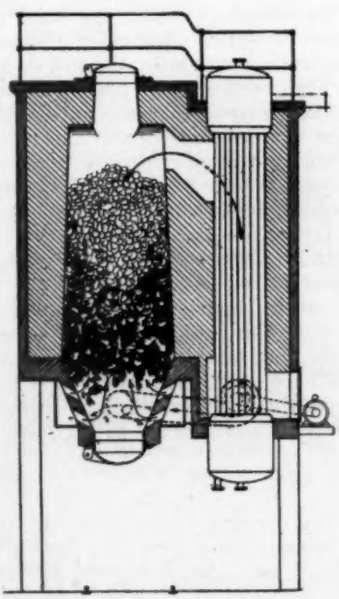
For more than a year the Zurich gas works has been operating a coke-cooling installation which has given such good results as to warrant this special article, written by Chief Engineer E. Hohen. The apparatus is built by the Gebr. Sulzer A. G. of Winterthur, Switzerland, and is covered by patents. Its objects are to avoid cooling the coke by means of water, as is generally done in most by-product coke oven plants; to produce a compact and dry fuel by the slow cooling of the coke; to recover and utilize the heat, which is contained in the glowing coke.

The accompanying sketch gives a good idea of the general construction of the apparatus in question. It consists of a shaft-like receiver, into which the glowing coke, drawn from the retorts, is transferred, and of a vertical steam boiler, directly connected thereto. The coke is moved from the retort to the cooling apparatus by means of a rack and pinion traveling bucket arrangement. A fan is used to circulate the hot gases, which are found in the air-tight spaces, leading from the coke container and the steam boiler. In passing through the layer of coke, the oxygen disappears very rapidly, so that the gas, that receives the heat in the coke container and gives it up again to the steam boiler, is always the same in composition. Feed water and the hot gas flow in countercurrent directions. The cooled coke is dumped into carts through the bottom opening of the coke holder from time to time.

Experimental Results

The results of a test, made with this installation, are given below in compact form and indicate very clearly the operating efficiency of the installation:

1. Heating surface in the boiler—114 c.m.
2. Permissible operating pressure—7 atmospheres.
3. Duration of the tests—24 hours.
4. Average outdoor temperature—minus 0.3 deg. Cent.
5. Lowest outdoor temperature—minus 2 deg. Cent.
6. Number of furnaces in operation—five.



7. Number of retorts in operation—fifty.
8. Number of charges in coke holder—eight.
9. Number of emptied gas retorts, fifteen hours' standing time—sixty-six.
10. Weight of coke, net after deduction of tare—22,360 kg.

11. Weight of coke per retort—338.9 kg.
12. Feed water in twenty-four hours—10,980 kg.
13. Average steam pressure—5.4 atmospheres.
14. Temperature of feed water, in center—43.8 deg. Cent.
15. One kilogram of coke changes water into steam at 5.4 atmospheres pressure (steam figures)—0.491 kg.
16. Steam temperature—154.3 deg. Cent.
17. Heat content of one kilogram of steam at 5.4 atmospheres pressure—659.2 kg. calories.
18. One kilogram of coke changes water at 0 deg. Cent. into steam at 100 deg. Cent. (standard steam figures)—0.472 kg.
19. Heat content of one kilogram of steam at 100 deg. Cent.—640 kg. calories.
20. Utilized heat in one kilogram of coke—302 kg. calories.
21. Average temperature of the glowing coke—997 deg. Cent.
22. Maximum temperature of the glowing coke—1,072 deg. Cent.
23. Minimum temperature of the glowing coke—947 deg. Cent.
24. Temperature of the cooled coke in the center—327 deg. Cent.

The tests were made cooled in the regular course of the operation of the installation without taking any special pains to see that the heating surfaces were cleaned properly before the measurements were made. In reference to the weighing of the coke it is to be mentioned that this could be accomplished only with a spring balance. Even though the greatest care was taken in making the readings and in correcting for various errors, the figures obtained, which represent the weight of coke, are accurate within the limits of plus or minus 2 per cent. The temperature of the glowing coke is taken by the aid of a Wannur pyrometer. The point which appears hottest to the eye is selected for temperature measurement. However, the average temperature of 997 deg. Cent., as given above, is held to be lower than actually exists, as the topmost layer of coke cooled off immediately, due to exposure to the air, so that its color was darker than the under layers of coke. Toward the end of the experiment the temperature of the coke was rather high, which contributed somewhat to the good results obtained in regard to the heat utilization. The temperature of the cooled coke, withdrawn from the coke-cooling apparatus, was determined with the aid of a Le Chatelier thermometer. The average of these temperature determinations—that is, 327 deg. Cent.—nevertheless appears to be quite an uncertain figure.

Analyses of the Gas Given Off by the Cooling Coke

The following table shows the maximum and minimum results, obtained from seventeen samples of gas, analyzed with the aid of the Orsat apparatus. Two individual analyses are also given below:

	Minima	Maxima	Analysis 6 Before Drawing Off the Cooled Coke	Analysis 7 Directly After Filling the Cooler With Glowing Coke
Carbon Dioxide	11.0	16.0	14.1	11.4
Oxygen	....	3.6	1.1	0.6
Carbon monoxide	0.8	15.4	2.4	15.4
Heavy hydrocarbons	....	1.6	....	....
Nitrogen	74.6	83.0	?	?

From the results contained in the above table it is seen that the gases in the coke-cooling apparatus are very poor in oxygen, and it is also shown that the hotter the coke, the poorer the gases will be in oxygen. The oxygen content will then be at a maximum just before dumping the coke out of the apparatus, and at a minimum just after filling the coke into the coke holder. The maximum content of oxygen 3.6 per cent was found in a gas sample taken shortly before the cold coke was emptied out of the holder.

The proportions of carbon dioxide and carbon monoxide are also dependent on the temperature of the coke. When this is high, as just after the introduction of the glowing coke, then a part of the carbon dioxide is reduced to carbon monoxide. In the example, analysis 7, the gas showed 15.4 per cent of carbon monoxide right after the hot coke was dumped into the cooling apparatus. As the temperature was reduced a part of the carbon monoxide was burned to carbon dioxide, due to the reduction in the reducing powers of the coke. Hence, as is seen from analysis 6, the content of carbon monoxide was only 2.4 per cent just before discharging the coke; on the other hand the content in carbon dioxide was high.

The Coke Produced

The coke that is gradually cooled in accordance with this process possesses absolutely no moisture at all. For that reason, its heating power is greater than ordinary coke. The average ash in the coke was found to be 14.5 per cent. The heat value of the dry coke is then 6,800 calories. If the coke possessed 10 per cent moisture then its calorific value would be reduced to 6,070 valories, and if this increased to 20 per cent then the calorific value of the coke would be reduced further to 5,320 calories. The dry coke will result in a higher temperature in the furnace than when wet coke is used. This is of especial value in metallurgical plants.

Economic Features of the Process

The cost of the installation and the expenses involved in its maintenance and upkeep are given in considerable detail. The figures are reported in Swiss francs, and inasmuch as at the present time the dollar is below par in Switzerland, the financial results that were obtained with this installation could very

likely be bettered in this country. The data indicates that the entire installation can be made to pay for itself within a period of fifteen to eighteen months.

The author claims that the process is of considerable importance and utility in the field of heat conservation. It represents the first correctly carried out application of this idea, which has given any results at all, and which can serve as a basis of discussion.

Opinions on the Process

This paper was delivered before an opening meeting of the Swiss Gas Association and produced quite a lively discussion among the members. Several gasmen substantiated the reports of the good operation of the process. Others were not so sure that any great economic advantage was gained thereby. The argument that developed indicated that there was some question about the possibility of regaining the additional cost of the equipment and the maintenance of the same in a higher price for the coke, produced in the new process. There was also some question about the transportation of the coke from the retort to the cooling apparatus, in so far as its practicability, cost and effect on the coke itself were concerned. All were agreed that the coke, because of the fact that it contained no moisture, would be of considerable benefit to metallurgical plants which operated their coke oven plants along these lines. One engineer mentioned the fact that the utilization of the heat in the coke had been the subject of considerable work by an English firm, which developed the continuous type of vertical coke oven, wherein the heat in the coke, as it moved into the lower part of the retort, was used partly to preheat the air used in the combustion of the fuel in heating the furnace, and partly to decompose steam to produce water gas.

Making Satisfied Gas Customers

What the Columbus, Ohio, Companies Are Doing

By J. B. DILLON

All hail to the Columbus Gas & Fuel Company and the Federal Gas & Fuel Company, of Columbus, Ohio, for they have taken a stand to help not only the sellers of gas, but the sellers and users of gas appliances.

Using printers' ink, they are advertising:

Consider Your Gas Costs as You Do Your Food Costs

Does it ever occur to you that your gas bill may reflect waste as well as use of this great natural convenience?

The garbage can reveals an excessive grocery bill but there is no hopper to measure the waste of your gas fuel.

If your gas costs run high, it does not necessarily prove such a quantity of gas was essential to your needs.

Wasting gas, or losing it, is expensive at any price and the unit cost does not influence this fact.

Your gas company is anxious to co-operate with you in this particular to the end that you may make the most of gas without waste or loss.

It is the ambition of the gas company to have every consumer satisfied and to deserve a full community good-will. This is a daily effort, practised to the limit of the opportunities you permit.

With this purpose in mind, a gas saving department is maintained by your gas company for no other purpose than to advise you with reference to appliances and the use of gas and to check up your appliances, if need be. This department has nothing to sell and your use of it incurs no obligation on your part. It is a service department in the full sense, designed to help you make the most of gas with the least cost.

The Columbus Gas & Fuel Company.
The Federal Gas & Fuel Company."

Such an advertisement should be a joy-germ in the hearts and minds of all gas appliance dealers. The Columbus concerns are doing what every gas company should do and that is school the people from every angle relative to the use or abuse of gas. It has been well said that when anybody starts anything good, others will take it up. It is our duty as gasmen to see that the matter does not sink into forgetfulness.

You have often heard the expression: "A satisfied customer is our best advertiser." Yes, and you agree to that assertion. Well, when an inspection department helps Mrs. Housewife to save a few cents—maybe dollars—she is going to blab from the housetop and cellar. Right there you start the campaign that you so very much need.

Do not try and minimize the need for aggressiveness, neither scoff at the good or bad results that are brought about by gossip.

Really a Saving

In addition to saving money, such inspections will place gas appliances on their best behavior, because with no leaks, maladjustments, etc., they will work up to their top notch efficiency and when they do that there is nothing to equal them in their respective assignments.

This is the manner in which you should view the goods you sell, and you may rest assured that experimentation will bear you out and sustain your belief.

There may be some companies who serve both the gas and electrical current to the city and as it has been stated previously and is reiterated here, such companies usually boost the electrical features over gas because of the increased profit in electricity, and such dealers will give you very little encouragement.

Should such conditions as these happen to be yours

(*Continued on page* 70.)

New Style Association Meeting a Winner

Indiana Sets Precedent for Other States in Unique Gathering

By WALTER S. GREENOUGH

Theory has been definitely linked with practicality again by the public utility companies of Indiana. An idea, born in the mind of John C. Mellett, executive secretary of the Indiana Public Utility Association, has borne fruit of such an unusual nature that public utility men throughout the country well may study its possibilities in their own States. Public relations development for years to come was assured when the big Hoosier utility association successfully planned and staged an annual meeting in co-operation with the school of commerce and finance of Indiana University. The meeting was held last Friday and Saturday—and the ramifications of the benefits it eventually will bring to the doorsteps of Indiana utilities will not be fully known for years.

This Hoosier organization heretofore has accented the newer educational phase of the nation-wide effort to "sell" utility good-will to the public by finding many methods of sending utility information into the schools of Indiana. It remained for the Mellett idea to open the way for definite utility information to be spread before the eyes and ears of the thousands of embryo business and professional men of the State's big university at Bloomington. These students eventually will become the leaders of thought in Indiana. When they do—well, the public utility business in Indiana will at least not be a "foreign corporation" doing business in their respective communities. Back in their heads somewhere will be at least the fact that it is something well worth their study.

Hundreds of utility operators from all over Indiana went to the meeting. The speakers somehow sensed the grave importance of the opportunity that was given them to tell the story of public utility struggles to the future leaders of thought in the State, and their papers were of the type that should leave food for careful thought in the minds of students and faculty members alike at the university.

When announcement of this meeting was made in these columns some time ago we predicted it would be successful. This article tells whether we were right. To John C. Mellett, executive secretary, goes all possible credit for having given us something new. We congratulate him.—Editor.

Meeting Full of Real Meat

For the utility operators who attended the meeting it was full of meat—the subject of public relations being the predominant note of the meeting. Members of the Public Service Commission of Indiana, Eastern exponents of the "tell-the-public" theory and many representatives of the utility business in Indiana dilated on the wide range of opportunities that exist everywhere for the utility managers to bring their respective products into closer relationships with the lives of their respective customers.

It was the second annual meeting of the big utility association. The facilities of the school of commerce and finance were placed entirely at the disposal of the visitors by Dean W. A. Rawles, who also gave a splendid address before the association on the aims and viewpoints of those in charge of the new school at the State university.

That the public relations program of the Indiana association is being increasingly effective was brought directly home to interested persons throughout the State by the action of the body, taken at the meeting, whereunder it was voted to increase the appropriations for this year's public relations work by more than double the amount expended last year. Speaker after speaker emphasized the new relationship that is being developed between the public and the utilities—much of it due to such intelligent efforts as are being carried forward in Indiana under the direction of Mr. Mellett.

The New Officers

Charles L. Henry, of Indianapolis, president of the Indianapolis & Cincinnati Traction Company, was re-elected president of the association; S. E. Mulholland, Fort Wayne, general manager of the Northern Indiana Gas & Electric Company; E. J. Haas, of Evansville, general manager of Southern Indiana Gas & Electric Company, were named vice-presidents; Marshall V. Robb, of the Wabash Valley Electric Company, of Clinton, secretary; Charles C. Perry, president of the Indianapolis Light & Heat Company, treasurer, and John C. Mellett, of Indianapolis, executive secretary.

Another feature of the meeting was addresses before the Indiana University school of journalism by Walter A. Fairservis, editor of the AMERICAN GAS JOURNAL, and Lamber St. Clair, in charge of the advertising and public relations for the American Electric Railway Association. These addresses dwelt on

utility problems primarily, but also deviated into realms touching on newspaper and journalistic work. Mr. St. Clair also made a short address on the relationship between the utility and the public before the general session of the utility association.

Charles N. Thompson, an Indianapolis attorney of wide experience in the utility field, read a paper before the school of law of the university. Many of the addresses given at the meeting will be summarized in this and future issues of the JOURNAL.

Charles L. Henry, president of the association, addressed the utility meeting delegates and a convocation of the entire Indiana University student body on Wednesday, Jan. 11. At the general program of the utility conference, following its business meeting, the following read papers: Dean Rawles, Arthur W. Brady, of Anderson, president of the Union Traction Company of Indiana, on "Utilities and the Public". Frank E. Bohn, Fort Wayne, general manager of the Home Telephone & Telegraph Company, on "Problems of Expansion Confronting Utilities"; Howard A. Dill, of the Richmond Water Works Company, on "The Utility Load as an Indication of Industrial Conditions"; C. D. Calvert, of the Indiana & Michigan Electric Company, read a paper written by Fred A. Bryan, president of the company.

P. S. Commissioner Speaks

At the dinner for the utility men, held in the commons of the Student Building at the university, Edgar Blessing, of the Indiana Public Service Commission, made an address notable for its concise statements with regard to the present and future viewpoint of the relationship that should exist between the public and the utilities.

Following this address the delegates were entertained at a basketball game between Indiana University and Northwestern University, both members of the Western conference. Indiana won by a score of 21 to 18. Although it was then nearing midnight, the visitors were not through. They were taken to Science Hall, on the university campus and there given the opportunity to hear singers in the Chicago Grand Opera Company, via the wireless telephone station that has been developed at the university.

At the outset of Mr. Blessing's address he emphasized the point that it is the duty of every utility operator to so take his immediate customers into his confidence that little mooted questions of service, etc., will not continue to be the stumbling blocks they have in the long years that have passed so violently over hundreds of companies in the country.

"I am convinced that the public utility men of Indiana are fair and honorable men," he said. "And I have never lost faith in the great American public. Understanding between these two is the solution of the utility problems of to-day.

"Good service, adequate and comprehensive, without unjust discrimination—at a reasonable rate." This was the slogan which Mr. Blessing said he and the other members of the Indiana commission believed touched the crux of the utility problems of Indiana.

He exemplified his long discussion of how vital courtesy is to the utility business now, by using the extension of a water main into a sparsely settled district as an object. If such an extension cannot be made, because it will fail to return an adequate amount for many years on the investment, then the duty of the utility operator is not alone to refuse to make the extension but is as well to so educate his would-be patron that he will understand the intricacies of utility financing to a point that will send him away smiling from his unsuccessful interview with the manager, he said.

"Courtesy is reciprocal just as much on the part of the public," he contended. Then he emphasized that the public owes a distinct duty to the utility in studying its problems to the point that it shall not make unreasonable demands on the utility.

Emphasizes Need of Courtesy

"Courtesy to the service of the utility company is as the sparkle to the diamond or the fragrance to the rose," he declared.

Mr. Blessing spoke with great earnestness and incidentally referred disapprovingly to a recent utterance by Mayor Lew Shank of Indianapolis, in which the latter had declared for the repeal of the Indiana utility law. Because of the spirit of unrest, due to economic conditions, Mr. Blessing said that "public statements dropped here and there are the very things that breed socialism, bolshevism and anarchism."

"While no utility is entitled to go beyond its rights," he said, "yet no public clamor has a right to ask of that utility more than is fair." Mr. Blessing said he thought it is of great importance for the utility associations to get before the people of their respective States the proceedings and speeches at such meetings as that held at Bloomington.

The speaker said that forty-six States had established commissions and that no State, having established such a commission had returned to the old methods of control of utilities. He said that every utility is entitled to fair treatment and that every citizen is entitled to fair treatment, and for a while he discussed how such treatment might be accorded each. It is and will continue to be a difficult problem, he thought, and said it could only be done by keeping American citizenship high.

It is a great mistake, he said, for public utilities to present to commissions and courts "unreasonable claims."

Mr. Blessing, addressing his remarks to students attending the dinner, advised them to stand up for fair dealing and shun demagogy in the event they ever stood before the public. He asserted that counsel for litigants "that come before me and appeal to prejudice will barter away their cause and sink their clients below the mark of respectful consideration."

The Big Problem

Finally he said that he believed the "great problem that you have to solve is the problem of educating the public."

He said he was not experienced in how this should be done, but he advised the association not to stop with distributing the proceedings of the association to members, but to see to it that the addresses and the principles of utility regulation discussed in the papers, be "gotten to the public.' When the public grasps these problems, he said, he was sure that a better understanding between the utilities and their respective patrons would obtain with all the benefit

to both sides that such an arrangement would develop.

During the dinner various students performed "stunts" for the delectation of the utility men and their guests. The first prize in this contest was awarded to Richard Mills, who put on an original monologue in which he characterized the utility men as "The Public Ability Association." He was given the prize because of this "line," which made an instant hit with his hearers.

Commercial Section of A. G. A. to Make Intensive Sales Effort in 1922

The managing committee of the Commercial Section met at association headquarters on Jan. 4, there being present A. P. Post, chairman; William Gould, vice-chairman; Louis Stotz, secretary; J. E. Davis, Chicago, Ill.; A. R. Beal, Newburgh, N. Y.; J. D. Shattuck, Chester, Pa., and H. A. Doering, Mount Vernon, N. Y.

It was decided that during 1922 the Commercial Section activities would be confined to subjects of outstanding importance and such as would enable the association to render some definite merchandising service to our members.

The subject of sales is at present the most important subject with which we have to deal, and it is planned to give our membership some definite sales help at regular intervals during the year.

Monthly Sales-Letter Service

The committee on sales stimulation proposes, therefore, to issue to the membership a monthly sales letter, in each of which there will be suggested some one feature of selling. Members should make a point of keeping this series of sales letters constantly before them. Sales ideas are always worthy of the most careful consideration, and your committee hopes that the suggestions they have to offer in this manner will be a real inspiration to gas companies to intensify their selling effort.

Window-Display Book

Through the A. G. A. Monthly and in other ways our membership will be assisted in the planning of gas company window and showroom displays. There is now being prepared at association headquarters a book of displays of various types which will suggest ways and means for planning appliance displays, holiday displays, seasonable uses of gas, etc., etc. This display book will be offered at cost within a few weeks, and announcement will be duly made when it is available.

National Selling Campaigns

The national sales campaigns, such as were originally conducted under the auspices of the National Commercial Gas Association, will be revived. It is planned to submit to our membership at an early date a plant for conducting six national gas range weeks during the year, one every other month, and suggestions for other campaigns to be used during alternate months. Such campaigns as will stimulate sales of water heaters, heating appliances, lighting appliances and industrial uses of gas will be undertaken.

In this connection it is the opinion of those who have been most successful in their gas company merchandising efforts that continuous sales effort in the gas industry is essential to successful results. Spasmodic sales effort is ineffectual in keeping your sales organization together, and in view of the fact that the executive board of the American Gas Association has gone on record as advocating that the sales department be a permanent one, and at least a self-supporting department of the gas company's activity, this policy should be carried out by every member-company. These sales campaigns were always successful in the past and can be made so again.

Educational and Sales Literature

Another subcommittee will devote its energies to the preparation of pamphlets of an educational character for general distribution by companies to their customers. These booklets will be of a popular character and designed to bring about a better public relationship and induce a more efficient and greater use of gas. Syndicated literature of this character can be gotten out by the association at a cost that will enable every company to participate in its local distribution.

Increasing Industrial Sales

The industrial sales committee has in mind the preparation and distribution of information and data sheets covering the utilization of gas for industrial purposes. The service is designed to assist gas companies in getting additional industrial users on their books. These information sheets will be most helpful and suggestive to the industrial sales representative, for they will not only give him essential facts regarding particular installations but will also suggest classes of business in his territory which might have been overlooked.

The use of industrial contracts between gas companies and their large customers is again urged at this time. The 1921 committee report on this subject offered definite recommendations in connection with this important matter, and companies are again reminded of the advisability of having a definite contract with this class of customer. Copies of the 1921 report are available for the asking.

The committee has been requested by the managing committee to draft a model form of contract based on the suggestions in the 1921 report, and when this is completed due announcement of the fact will be made.

Contributions to the A. G. A. Monthly

A committee composed of the representatives of affiliated associations serving on the managing committee of the commercial section, has been appointed, whose duty it will be to keep the Commercial Section of the A. G. A. supplied with instructive and helpful articles on various phases of gas company merchandising.

Sales managers are requested to bear in mind that if they conduct any successful selling effort that others in our industry may be benefited by knowing about it. This is a reciprocal proposition—tell the other fellow what you are doing, and possibly you can get a valuable pointer from what he is doing. Let us do more of this swapping of sales ideas; it will be helpful to the entire industry and carry out one of the objects for which we joined the American Gas Association.

(*Continued on page* 64.)

Estimate Nine Billion Barrels of Oil in Ground

Country's foremost Geologists Figure Twenty Years' Supply Remains

A review of the producing, probable and possible oil-bearing regions in the United States by a joint committee composed of members of the American Association of Petroleum Geologists and of the United States Geological Survey has resulted in an inventory estimate that nine billion barrels of oil recoverable by methods now in use remained in the ground in this country Jan. 1, 1922.

Unlike our reserves of coal, iron and copper, which are so large that apprehension of their early exhaustion is not justified, the oil reserves of the country, as the public has frequently been warned, appear adequate to supply the demand for only a limited number of years. The annual production of the country is now almost half a billion barrels, but the annual consumption, already well beyond the half-billion mark, is still growing. For some years we have had to import oil, and with the growth in demand our dependence on foreign oil has become steadily greater, in spite of our own increase in output.

Estimates of our oil reserves can be made with far greater completeness and accuracy than ever before. During the last eight years a large part of the territory in the United States that may possibly contain oil has been studied in great detail by oil geologists; wildcating has spread through "prospective" into many regions of "possible," and locally even into regions of "impossible," territory; oil fields have been definitely outlined and new ones discovered; and, finally, improvement in methods and special training in the calculation of oil reserves and of the depletion of oil properties have been developed to meet the requirements of the tax laws. Accordingly, in order that the public may get the fullest benefit of this newly available information, the United States Geological Survey in March, 1921, invited the American Association of Petroleum Geologists to cooperate with it in a review of the producing, probable and possible oil territory of the United States and in the compilation of an estimate of the petroleum remaining in the ground and recoverable by present methods. This invitation was promptly accepted by the association, which designated a number of its ablest members of well-known wide experience, good judgment and high professional standing to serve with the oil geologists of the Survey as members of a joint committee.

The committee responsible for the original preparation of the estimates and finally for the adjustment and revision of the results in joint conference comprised F. W. De Wolf, State geologist of Illinois; W. E. Wrather, of Dallas, Tex.; Roswell H. Johnson, of Pittsburgh, Pa.; Wallace A. Pratt, of Houston, Tex.; Alexander W. McCoy, of Bartlesville, Okla.; Carl H. Beal, of San Francisco, Cal.; C. T. Lupton, of Denver, Col.; Alexander Deussen, of Houston, Tex.; K. C. Heald, of Washington, D. C., and G. C. Matson, of Tulsa, Okla., all representing the American Association of Petroleum Geologists; and, for the Federal Survey, David White, chief geologist, chairman; W. T. Thom, Jr., A. E. Fath, Kirtly F. Mather, R. C. Moore, State geologist of Kansas, and K. C. Heald. Mr. Heald represented both the Survey and the association. These men were assisted in subcommittees by a large number of the leading oil geologists of the country, including oil company geologists, directors of State geological surveys and consulting geologists, who were especially familiar with the regions considered All these co-operated whole-heartedly in the canvass of our oil reserves, and many oil companies also furnished confidential data for use in the preparation of estimates.

Calculations Reasonably Reliable

The calculations of the oil reserves in the proved and discovered fields are reasonably reliable, and those for regions regarded by the geologists as embracing "probable" future oil fields are based on all the available data and are entitled to high respect, but the committee wishes it most clearly understood that the estimates of oil in "possible" territory are absolutely speculative and hazardous, and that, although they represent the best judgment of the geologists, they nevertheless may be, at least in part, wildly erroneous. The questions involved are not only how much a particular doubtful regions will yield, but whether it will furnish any oil whatever. On the whole the estimates are undoubtedly the best that have ever been made for the United States and better than have hitherto been prepared for any oil country or district of the world.

The estimates for local areas, fields or districts have been consolidated by States, groups of States or broad regions in the case of non-productive States.

Estimated Oil Reserves of the United States, by States or Regions

	Millions of Barrels
New York	100
Pennsylvania	260
West Virginia	200
Ohio	190
Indiana and Michigan	70
Illinois	440
Kentucky, Tennessee, northern Alabama and northeastern Mississippi	175
Missouri, Iowa, North Dakota, Wisconsin and Minnesota	40
Kansas	425
Oklahoma	1,340
Northern Louisiana and Kansas	525
Texas, except Gulf Coast	670
Gulf Coast, Texas and Louisiana	2,100
Colorado, New Mexico and Arizona	50
Wyoming	525
Montana, Nebraska and South Dakota	100
Utah, Nevada, Oregon, Washington and Idaho	80
California	1,850
Eastern Gulf Coastal Plain and Atlantic Coast States	10
	9,150

The New England States are regarded as too unpromising to deserve consideration. Most of the northern peninsula of Michigan and the State of Minnesota are placed in the same category. The small quantities allocated to some other States indicates how little hope these geologists have of finding extensive oil fields in them. Some of these very doubtful regions will give no oil, but others will make good the deficiencies. The estimates are as a whole distinctly conservative.

Of the total estimated oil reserves of the United States, amounting in round numbers to nine billion barrels, five billion barrels may be classified as oil in sight and four billion barrels as prospective and possible. Rather more than four billion barrels should be assigned to the heavy-oil group. These oils will be recovered mainly in the Pacific Coast, Rocky Mountain and Gulf States. The contents of the Lima-Indiana region, which yields oil of a distinctive type, are estimated at forty million barrels. In general the so-called paraffine oils of moderate and high grade, as contrasted with the heavier oils, amount in all to about five billion barrels. The estimated reserves of high-grade oils of the Appalachian States are about 725 million barrels.

The estimated reserves are enough to satisfy the present requirements of the United States for only twenty years, if the oil could be taken out of the ground as fast as it is wanted. Should these estimates fall even so much as two billion barrels short of the actual recovery, that error of 22 per cent would be equivalent to but four years' supply, a relatively short extension of life. However, the committee expressly decries the too frequent assumption that inasmuch as the estimated reserves appear to be sufficient to meet the needs of the country at the present rate of consumption for twenty years, therefore the reserves will be exhausted at the end of that time or, at most, a few years later. This assumption is absolutely misleading, for the oil pools will not all be found within that length of time, drilling will be spread over many years as the pools are found, and the wells cannot be pumped dry so quickly. Individual wells will yield oil for more than a quarter of a century, and some of the wells will not have been drilled in 1950. In short, the oil cannot all be discovered, much less taken from the earth, in twenty years. The United States is already absolutely dependent on foreign countries to eke out her own production, and if the foreign oil can be procured this dependence is sure to grow greater and greater as our own fields wane, except as artificial petroleum may be produced by the distillation of oil shales and coals, or some substitute for petroleum may be discovered.

All the estimates except those for one region, noted below, include only the oil recoverable from the ground by present methods, but it is practically certain that the percentage of oil to be recovered from the American oil fields will be vastly increased by the application of new and improved methods of recovery. At present, however, this phase of production may be regarded as in the experimental stage. Little has been definitely determined as to the applicability of "air pressure," "water drive," "gas pressure," "vacuum extraction" and other new methods to different regions, with their variation in conditions, or to the increase in production to be counted on from the use of these methods. The committee therefore feels that at present any estimates of such possible additional recoveries would probably contain errors enormously greater than those inherent in the estimates made on the basis of methods now in use. In only one region are the geologic conditions so well known and the experience with improved methods on a commercial basis so extensive and so long continued as to justify the formulation of estimates based on the results obtained. This is the region in northwestern Pennsylvania and southwestern New York, where the "water drive" is now employed to obtain oil from the Bradford sand, which was supposed to be largely exhausted. Under the peculiar conditions there the use of this method will result in the recovery of a large quantity of oil that cannot be recovered by ordinary methods of production. Allowance for the additional oil thus recovered has therefore been made in the estimates. It has already been found, however, that this method is not applicable to some other districts, and accordingly no allowance has been made for possible additional recovery through its use where its suitability to the local conditions has not been actually demonstrated.

In the light of these estimates as to the extent of our supplies of natural petroleum, the joint committee points out the stern obligation of the citizen, the producer and the Government to give most serious study to the more complete extraction of the oil from the ground, as well as to the avoidance of waste, either through direct losses or through misuse of crude oil or its products.

Illinois Gas Association Establishes Two Research Graduate Assistantships

To assist in the conduct of engineering research and to extend and strengthen the field of its graduate work in engineering, the University of Illinois maintains fourteen research graduate assistantships in the Engineering Experiment Station. Two other such assistantships have been established under the patronage of the Illinois Gas Association. These assistantships, for each of which there is an annual stipend of $600 and freedom from all fees except the matriculation and diploma fees, are open to graduates of approved American and foreign universities and technical schools who are prepared to undertake graduate study in engineering, physics, or applied chemistry.

An appointment to the position of research graduate assistant is made and must be accepted for two consecutive collegiate years, at the expiration of which period, if all requirements have been met, the degree of master of science will be conferred. Not more than half of the time of a research graduate assistant is required in connection with the work of the department to which he is assigned, the remainder being available for graduate study.

Nominations to these positions, accompanied by assignments to special departments of the Engineering Experiment Station, are made from applications received by the director of the station each year not later than the first day of March. The nominations are made by the executive staff of the station, subject to the approval of the president of the university. Nominations are based upon the character, scholastic attainments, and promise of success in the principal line of study or research to which the candidate proposes to devote himself. Preference is given those applicants who have had some practical engineering experience following the completion of their undergraduate work. Appointments are made in the spring, and they become effective the first day of the following September. Vacancies may be filled by similar nominations and appointments at other times.

The Engineering Experiment Station, an organ-

(*Continued on page* 68.)

As the Journal Views It

A Successful Municipal Plant

From time to time we have had considerable to say regarding municipal ownership and operation. Generally speaking, we have been opposed to anything of the kind. However, there recently came to our attention one plant for which gasmen generally have an excellent word to say.

L. M. Jordan is superintendent of the Gas Department of Rocky Mount, N. C., which is the plant referred to, but, after looking over the statement which Mr. Jordan kindly furnished to the AMERICAN GAS JOURNAL, we are inclined to the opinion that the greatest part of the success of the venture is due to his management. His statement follows:

"This is a municipal plant and in auditing the city books each year the auditors make one general report covering all of the city's properties as well as the administrative affairs and for this reason the reports on the Gas Department separately are not available, but I am pleased to give you a general outline of the Gas Department's activities with rates, etc.

"The city issued bonds for $170,000 in 1914 and built the gas plant here, installing in the plant a four-foot water gas set, one fifty horse-power boiler, two fourteen-foot purifying boxes, a five-foot station meter, a 12,000-gal. oil storage tank, and a 100,000-cu.-ft. holder. In addition to the plant we put in about ten miles of cast-iron mains.

"On Aug. 1, 1915, we had 307 consumers with a send-out of 548,600 monthly.

"On Aug. 1, 1916, we had 491 consumers, 849,600 monthly send-out.

"On Aug. 1, 1917, 608 consumers, 1,698,300 monthly send-out.

"On Aug. 1, 1918, 831 consumers, 2,095,300 monthly send-out.

"On Aug. 1, 1919, 1,200 consumers, 2,889,800 monthly send-out.

"On Aug. 1, 1920, 1,719 consumers, 5,379,100 monthly send-out.

"On Aug. 1, 1921, 2,021 consumers, 7,478,600 monthly send-out.

"On Nov. 1, 1921, 2,087 consumers, 8,560,000 monthly send-out.

"The portion of the city covered by our gas mains has about 10,000 population and 95 per cent of these are using gas for cooking, heating water, etc.

"In addition to the original $170,000 bonds, the city has invested $330,000 in the Gas Department and we now have eighteen miles of cast-iron mains and the plant now consists of one eight-foot-six-inch water gas set, one five-foot set, one four-foot set, one 50,000-cu.-ft. relief holder, one 100,000-cu.-ft. storage holder, one 300,000-cu.-ft. storage holder, two fourteen-foot purifying boxes, two twenty-foot purifying boxes, three oil storage tanks, with a capacity of 120,000 gal., 110 horse-power boiler, one Thomas meter with 100,000 cu. ft. hourly capacity, and all modern equipment.

"The first three years of operation the Gas Department showed a deficit of $600 after paying all operating charges, interest on the investment of 6 per cent, and 5 per cent depreciaton. The next three years of operation the Gas Department showed a net earning of $34,000 after paying interest, depreciation and all operation charges.

"Our rates from the starting of the gas plant until Sept. 1, 1920, were as follows:

"$1.50 per thousand cubic feet gross.

"10 per cent discount for payment by the fifth.

"20 per cent discount for payment by the fifth on amounts of 15,000 cu. ft. or over.

"On Sept. 1, 1920, we increased our rates to:

"$2 per thousand cubic feet gross, 10 cents per thousand discount for payment by the fifth, 15 cents discount per thousand cubic feet on amounts of 15,000 or over, if paid by the fifth.

"On Oct. 1, 1921, the following rate went into effect:

"$1.70 per thousand cubic feet gross.

"10 cents per thousand cubic feet discount for payment by the fifth.

"20 cents per thousand cubic feet discount for payment by the fifth on amounts between 15,000 and 50,000 cu. ft.

"30 cents per thousand discount for payment by the fifth on amounts of 50,000 or over.

"On Feb. 1, 1916, the Gas Department opened an appliance store, and since that time has been selling all appliances at 20 per cent profit with a 10 per cent discount for cash, or giving the purchaser a ten monthly payment plan. This department has been very successful and has shown a profit each year. I believe our success has been due largely to our selling good appliances, attending all complaints promptly and keeping a good normal pressure on the mains."

"Jim" Hill Retires After Twenty-five Years of Faithful Service

"Jim" Hill has laid aside his brown uniform with its gold buttons which distinguished him as a part of officialdom, just as he laid aside his coachman's regalia, including his high hat and cockade that went with it, twenty-five years ago.

This time "Jim" has discarded the outward signs of active business to live in retirement at Salem, N. J., where he was born, as he describes it, "among the Quakers." From now on "Jim" can attend all the services in the Methodist Episcopal (colored) Church in Salem and have plenty of time to seriously consider the last Sunday sermon, or analyze the prayers that were offered in the Wednesday night meeting.

It so happens that "Jim" has just been placed among the other pensioners of the Consolidated Gas Company now that he is seventy-one years old and has four grandchildren, and because he had served the company for a quarter of a century as its confidential messenger and the colonel of the regiment of youthful messengers in the gas company's big office building at Irving Place and Fifteenth Street. "Jim" Hill was born on a farm at Salem, N. J., and there it was that he learned all that was to be known about grain growing and horses, and it is his boast to-day that no man knows more about horses of gentle breeding than he does. Hill came to New York City where, as he says, "there were better opportunities for broadening out. The good Lord has given me health and courage and He has, and always will, guide my footsteps. It is the same good Lord who to-day has brought me freedom from toil and business cares and has, through the kindness of heart of those gentlemen of the executive committee of the gas company, given me what I call my 'honorable discharge' and a liberal pension."

Hill was first employed in this city for a period of eight months as a butler for a private family living in Irving Place near Seventeenth Street. One day he was accompanied by a liveryman to the residence of Mr. Pio Echeverria, a prominent Spanish family in this city, who were looking for a competent coachman. Mrs. Echeverria, before her marriage, was Miss Harriet A. Dykers, a member of an old New York family and a sister of Mrs. Jose de Navarro, the mother-in-law of Mary Anderson, the actress. Hill had been in the employ of the Echeverria family about a month when Mrs. Echeverria asked him one day to drive her to her jewelers', Black, Star & Frost, who were then in Fifth Avenue near Twenty-ninth Street. When they reached the store Mrs. Echeverria said to her coachman, "I notice you have no watch, James, come into the store with me." The footman remained outside to take care of the horses. Hill went into the store, where Mrs. Echeverria looked over a collection of watches and finally picking out one said, "Put that in your pocket and see if it's a good timepiece. It is guaranteed for a year." Hill did as he was told and to-day he is still carrying the old hunting-case watch and he proudly shows this inscription on the inside of the back case: "J. H. H. from H. A. E., May 8, 1878." Then Hill will say with a convincing nod of his head, "There never was a better timepiece than that. It has been running 'true to form' all these forty-three years. A wonderful watch; wonderful!"

During many of the thirteen years he was employed by the Echeverria family he accompanied his master and mistress to Europe as their personal servant and, as he says now, it was during those seasons that he had an opportunity to visit every country with the exceptions of the Holy Lands, Japan and China. His service with the Echeverria family terminated when the family found it necessary to discontinue having their horses and carriages.

"Jim" Hill's brother, Abraham, had for many years been the private coachman for Lewis B. Brown, a prominent and wealthy resident of this city, whose daughter was the wife of Harrison E. Gawtry, the organizer and first president of the Consolidated Gas Company of New York. Mr. Brown, among his real estate holdings, owned hundreds of acres on the New Jersey coast which became the site of Elberon, N. J., which obtained its name from the original owner of the land through a combination of his initials and a part of his surname.

It was through his brother "Abe" that "Jim" Hill received his appointment as confidential messenger to the officials of the gas company. This was a position of trust which Hill filled with scrupulous integrity up to a few days ago when the executive committee of the company placed him on the retired list and the officers of the company personally extended to him their good wishes for his future and made known their regrets that "Jim" Hill had passed into the superannuated class.

Commercial Section of A. G. A. to Make Intensive Sales Effort in 1922

(*Continued from page* 60.)

Retail Pricing of Gas Appliances

The retail price of most nationally popular commodities is the same whether you buy them in Portland, San Antonio or Boston, and this applies to electrical merchandise to a great extent. Do you find the electric washing machine sold at different prices by various classes of dealers or in widely scattered communities? The answer is, No.

This is not the case with gas merchandise, however. We find a certain make of gas range, for instance, same type and size, selling for varying prices in the same community. The gas company has one price, the department store another, and the plumber and small dealer yet another. Usually the gas company's price is the highest of the three. Would it not be an ideal and helpful condition were some plan worked out by which the resale price of any certain gas range, for instance, could be made more uniform? This is one of the problems the Commercial Section will attempt to solve this year. If you have any thought on the subject send them to association headquarters.

This is your association, and you are an integral part of its effective working. The association is not in business for profit but solely to benefit its membership and the gas industry generally. Whatever plans are advocated from association headquarters they are the consensus of the best thought of the industry and need your co-operation to make them successful. Let us get our merchandising business under full sway during 1922.

Developments in Gas Technology

Important Information Gathered from All Parts of the World

By ISMAR GINSBERG, B.Sc., Chem. Eng., Associate Editor

Incandescent Mantles

The protection of the gas mantle so that it does not break in transportation or in being set up on the burner is an important consideration. An English patent (No. 154138) has been granted on a process of coating the mantle with a viscous fluid or a clear paste, consisting of a mixture of kaolin or other similar clayey product and phosphoric acid. For this purpose there can be used likewise a mixture of 90 per cent phosphoric acid and 10 per cent of silicate of alumina. When the mantle can be rotated on a lathe the coating is applied by means of a brush. In the case of mantles for inverted burners the former are mounted on forms, which can be channeled or perforated so as to allow the liquid to run off. Mantles to be used in straight burners should be coated from top to bottom, and then reversed. The coating may be applied at any stage of the process before burning.

The Efficiency of Cooking and Heating Apparatus with the Use of Lean Gas

In the *Monats Bulletin* (May, 1921) of the Swiss Gas Association, Dr. E. Ott, the manager of the gas works in the city of Zurich, Switzerland. has published a paper on the effects produced on the efficiency of heating and cooking apparatus by mixing water gas with coal gas. The tests were made both with the old-style large-head burners and with the modern economical burner. A cylindrical pot, twenty-two centimeters in diameter, filled with 3.5 liters of water, was used in the experiment. Arrangements were provided for varying the gas pressure and for measuring the quantity of gas consumed within a definite period of time, as well as of the temperature of the water before and after heating. Various sorts of lean gases were used, such as coal gas diluted with water gas. with more or less carbon dioxide, etc. The following results were obtained:

1. Lean gases, which do not contain too much carbon dioxide or other inert gases, such as nitrogen, gave a better efficiency than the pure coal gas. By efficiency is meant the heat effect in the water boiler divided by the heat energy in the gas consumed to produce this effect.

2. The reduction of the heating value of the gas by admixture with carbon dioxide reduces the efficiency.

3. The change in the gas pressure, when the flame is correctly regulated (admixture of the correct amount of air, the correct length of flame by regulating the position of the burner valve) has no essential effect on the efficiency of the heating.

The fact that the efficiency is lowered by the admixture of carbon dioxide and nitrogen is clearly due to reduction in the flame temperature of the gas, which has a bad effect on the rate of heat absorption in the water boiler.

On the other hand, the adulteration of coal gas with water gas or hydrogen or carbon monoxide increases the flame temperature of the gas, which improves the heat absorption in the water boiler. Hence the reduction in the calorific value of the gas should be accomplished only through an increased production of combustible gases per unit of weight of coal. and not by sucking in nitrogen, that is air.

Water-Gas Tar as Wood Preservative

To be an efficient wood preservative a substance should be able first to penetrate the wood easily, then remain in the wood; that is, not ooze out very readily as soon as the temperature rises, and at the same time have both a waterproofing and toxic action on the wood. Tests have been made on the use of water-gas tar for this purpose, whether the tar is in the crude state or refined, or in admixture with distillates from the tar. It was found that very good penetration could be obtained with a refined tar having a specific gravity of 1.14 and a viscosity as high as 2.4 Engler at 100 deg. Cent. Blocks of wood treated with tar were completely impregnated with the same.

How long the material will stay in the wood will depend on the evaporation of the same, the leaching and the change in chemical composition of the tar. It is to be expected that the loss due to evaporation, which would depend on the vapor tension of the tar, would be lower in the case of the water-gas tar than in that of the coal-tar oils of the same gravity. This expectation was confirmed by actual tests. The ability of water-gas tar to prevent the decay of the wood impregnated with it has been demonstrated by the fact that railroad ties treated in this manner have been in use for ten years without a sign of decay.

Rate of Carbonization of Coal

In an address before the Society of Chemical Industry of Great Britain, Dr. G. Weyman discussed the results obtained by observing the rate of gas yield when a known amount of coal was placed within a steel tube and heated to a certain degree by plunging the same into a bath of molten copper. The results that he obtained from this research are very interesting and important, especially from the standpoint of the low temperature carbonization of coal. These conclusions are as follows:

1. The transmission of heat through the charge of coal in the steel tube was found to be effected most rapidly by the gases evolved, and not by conduction or radiation, which are both very slow in acting. The high rate of carbonization of coal in the low temperature carbonization process, where the heating is entirely internal and carried out by means of superheated steam, substantiates this conclusion.

2. It was also found that the transference of the heat was almost entirely stopped by the formation of

an impervious plastic layer, through which the gases could not pass. Such a layer forms in coals that give adherent coke.

3. The size of the particles of the coal that is being carbonized has a great effect on the formation and continuity of this layer of plastic tar, as the larger these particles the more discontinuous this layer is and hence the greater the rate of carbonization.

4. A critical size of coal was found to correspond to a maximum rate of carbonization in a retort of given diameter.

5. The coals tested are arranged in the following order of ascending maximum rate of carbonization: Coking coals, gas coals, cannels, anthracite and non-cooking coals (see GAS JOURNAL, 1921, 383-4).

Concrete Gas Producer

British patent No. 169940 tells of a gas producer whose body is built of reinforced concrete and is suspended from uprights by means of a reinforcing ring. Inside the body portion is a bell of refractory material, the space between the bell and the body being filled with a heat-insulating material.

Rotating Gas Washer

The Dortmunder Vulkan A. G. has obtained a patent (German patent No. 334974) on a rotating gas washer, having a conical drum. The drum has sides tapering towards the bottom and a perforated base rotates within the chamber, which contains the washing liquid. The gas is led into the drum through a central tube which rotates with the drum. A spray of washing liquid is discharged into the inlet tube, so that intimate contact is effected between gas and liquid.

Removal of Sulphur from Gas by Oil Washing

Refined paraffin oil is used for the purpose of removing the sulphur contained in coal gas. A gas containing 35 to 160 grains per 100 cu. ft. is washed with such oil in a series of three-tower scrubbers. In order to reduce the sulphur content by 50 per cent at 70 to 75 deg. Fahr. it is necessary to employ eight gallons of oil per 1,000 cu. ft. of the gas. The best operating temperature is 60 deg. Fahr. About 0.5 gal. per ton of coal of naphthalene and benzol is also removed from the gas.

The oil is then steam distilled to remove the carbon disulphide, naphthalene and benzol. The temperature and speed of distillation determine the proportion of benzol left behind in the oil and the quantity of benzol subsequently removed from the gas. The maximum reduction in the calorific value of the gas when fresh oil is introduced into the system amounts to 25 B.t.u. The freezing point of the oil is —3 deg. Cent. when fresh, and —5 deg. Cent. after continued use and redistillation (see GAS JOURNAL, 1921, 729-730).

Some Uses for Sulphocyanates

Sulphocyanates are produced in the gas-making process by the reaction of the sulphur with the carbonaceous matter in the coal and the purifying medium used to remove the volatile impurities, resulting thereby, from the evolved gas. The great difficulty has always been to find a suitable use for these sulphocyanates, besides converting them into ferrocyanides or other cyanogen compounds. H. E. Williams in the Journal of the Society of Chemical Industry, 1921, pages 221 to 224 (a French translation has also appeared in *La Revue des Produits Chimique*, 1921, pages 657-66) has written an interesting article on the commercial application of sulphocyanates in the spinning of filaments, the mercerization of cotton fabrics, the parchmentization of paper and the manufacture of "vulcanized fiber" from cellulose.

It is stated that a very remarkable parchmentized paper is made by dipping paper, without any preliminary preparation, into a concentrated solution of equal parts of calcium sulphocyanate and chloride of calcium at the boiling point (155 to 157 deg. Cent.) and then cooling the solution to 130 deg. Cent. Paper possessing a loose texture is preferable for this purpose. The parchment product is exceptionally strong.

In the manufacture of vulcanized fiber, the paper is first parchmentized and then passed into a second bath of the same mixture of calcium sulphocyanate and chloride, but not so concentrated as in the first step in the process. The paper is then passed between rollers and compressed, and is then wound around a drum of large diameter. When the desired thickness is obtained, the mass is heated for half an hour at 120 to 130 deg. Cent., cooled, washed and dried. The product obtained in this way resembles vegetable ivory very much. It can be sawed, turned on a lathe, perforated and machined in any way, and in addition thereto it can be given a high polish.

All degrees of mercerization can be obtained by varying the conditions under which the cotton fabric is immersed in solutions of calcium sulphocyanates. Jute fiber may be softened likewise by boiling in a solution of this salt.

Coke from High Volatile Coal

German Patent No. 317,120 is concerned with a method of manufacture of a solid coke from high volatile coal. A low volatile coal is first made from the original coal, and this is added to the high volatile coal before coking. The coking of the mixture will give a solid coke.

Continuous Water Gas Producer

(*Continued from page* 54.)

Thirty-three pounds of water used per MCF equal 0.429 cent.

Total cost of producing 1,000 cu. ft. of gas:

Coal	$0.07040
Water	0.00429
Labor	0.02000
Depreciation	0.01000
Total	$0.10649
Overhead	0.01531
Total	$0.12000

Cost of gas containing 1,000,000 B.t.u.—40 cents.

"More Sales, More Profits, More Business"

John H. Hartog Gives Interesting Talk to Gas Appliance Dealers' Association in Portland

It is said that once upon a time a Chicago man advertised, "How to increase your beer sales. Send $1 for full instructions. Results guaranteed." He was flooded with thousands of answers, each enclosing a dollar, and in response he mailed them a postal card, reading: "How to sell more beer: Give less foam."

This is not all joke. There is some truth in it, for people buying beer were entitled to beer. And the question of "How to increase the sale of gas appliances" can be answered in the same three words, namely, "Give less foam." That is, the most important one item to increase the sale of gas appliances is satisfied customers.

You may advertise liberally, but if your appliances do not satisfy, you are not building for the future, but only creating a temporary interest. Of the two methods: Satisfying your trade without advertising, or advertising without satisfying the trade, I would prefer the former. It would be a slow process, too slow for a live man, but at any rate it would gradually create results.

Satisfy and Create Demand

That's why this club of dealers was formed, that they may be able to ascertain how to install satisfactorily what they sell and how they may build for their own future by selling appliances that will satisfy and create further demand.

It is short-sighted to sell something just for the momentary profit it may bring and have it unsatisfactory, thereby making future business difficult, if not impossible.

Do you know whether the appliances you sell are giving satisfaction? There was a time when the dealer might say, "I should worry! Let the gas company worry over that." But experience has taught all dealers that they and the gas company are partners, that neither can suffer loss through dissatisfied customers without the other suffering also. All dealers may not be able to be present at the G. A. D. Club meetings in person, but it is of the greatest importance to them that the man who handles their gas appliances attends and learns all he can about the intricacies of gas and its uses.

Last week Mr. Conner addressed you on the importance of having all gas appliances vented so that the products of combustion do not enter the living quarters. There are many dealers in America who sell house-heating and perhaps water-heating appliances without vent and apparently haven't the slightest idea why their business falls off.

Possibilities in Field

Do you know the potential possibilities of your appliance business? Let me give you some figures that may surprise you.

With Portland's population of over a quarter million people, with, say, 50,000 houses (of which about 30,000 are owned by their occupants) we may conclude that there are probably 40,000 families that might use tank heaters. With about 18,000 tank heaters in use, that leaves a potential demand for 22,000. Probably 10,000 could afford automatic water heaters. With only 1,500 in use, there's a potential demand for 8,500 more. All of the 50,000 might use gas ranges. With probably 35,000 in use, that would leave a potential demand for 15,000 more ranges. Thirty thousand families owning their homes could heat with gas. Only 1,500 to 1,800 gas furnaces being in use, that would leave a potential demand for over 28,000 furnaces.

Suppose all of us together could supply one-tenth of these. Multiply that with the average profit on each appliance and see where you land!

But we never can approach any such goal, unless we refuse to handle unsatisfactory or inefficient appliances, and see to it that the appliances we do sell are installed and handled properly.

This has been the reason for the success of the Gasco furnace and the Radiantfire in Portland. The advertising is the thing that creates the demand but unless backed up by service and satisfaction, it is money wasted. Even the best appliance, if installed or handled wrongly, will become a hammer for the public to knock with.

When in doubt about the merits of any appliance which you desire to handle, ask the gas company. Don't ask only the manufacturer or his agent. You readily give him your time to let him tell you all about his wonderful creation. Why not spend a little of that time to let the gas company tell you whether or not it will pay you in the long run to handle the thing? In many a case the gas company could suggest some little change that would make an unsatisfactory appliance into a bread winner for you. The more satisfying gas appliances you can sell, the better for the gas company. Then why not recognize that fact and make use of the company's knowledge and willingness to be of service to you.

Co-operative Advertising

The second thing that can increase appliance sales is co-operation and that's another reason why this G. A. D. Club can be of such value to you.

For instance, when the gas company has its annual spring sale on water heaters, why couldn't we all have a sale? When gas-range week comes, why could not we all display and advertise ranges? And so on, all along the line. Just now we have finished our tests of the gas-fired Arcola house-heating system. We are going to advertise it, for it will fill a certain demand. There are people who prefer hot water heating to a furnace. That may be odd, but it is a

fact, nevertheless. For such, the gas-fired Arcola will be just the thing, especially for the few houses in this city that have no basement. Now the plumbers can buy these Arcolas from the gas company at the some list discount as direct from the American Radiator Company. Then why not all get together and put in ads big enough to compel attention? The gas company's ad alone might average two or three columns by five or more inches. But a dozen or more dealers, going in with the gas company, could together put in half-page ads that would be striking and yet cost but little per dealer.

Thirdly, every dealer should invest a few hundred dollars in samples. Most plumbers have no display in their window, nor on their floor. A few hundred dollars invested would be an interest expense of only two or three dollars a month, but it is necessary in order to create business.

Finally, every dealer in gas appliances should subscribe to the gas journals and study them. He would gain information which would make him more familiar with the things he sells or installs, and he would become so convinced of the limitless possibilities of gas that his enthusiasm would impress the customers with whom he comes in contact. The result would be more sales, more profit, more business, and that's the very thing I was asked to speak on.

Prizes Awarded in Economic Essay Contest

What is probably the most comprehensive study of the public utility situation made since the commission system of State regulation has become general, is contained in the essay on "The Regulation and Management of Public Utilities," by Charles Stillman Morgan, Ph.D., which has just been awarded the second Class A prize of $500 in the Hart Schaffner & Marx 1921 economic essay contest.

Mr. Morgan is economist in the Bureau of Valuation, Interstate Commerce Commission, and was at one time professor of economics and political science at Marietta College, Ohio. His whole education and experience have fitted him to compile a volume which will prove of much value to those interested in the finances or the operation of gas or electric power plants and electric railways.

The study deals particularly with the question of efficiency in management under the old, unhampered methods and under present conditions, showing impartially the advantages and drawbacks of each, and comes to the conclusion that it is proper to reward management but not capital for increased efficiency.

As every man is a consumer, every man will find much of interest in the study on "The Theory of Consumption," by Miss Hazel Kyrk, Ph.D., which goes deeply into the influences which the consumer exerts on the economic situation. It is very well done, and was awarded the Class A first prize of $1,000.

Honorable mention in Class A went to Miss Mollie Ray Carroll, Ph.D., associate professor of social science at Goucher College, Baltimore, for a well-worked-out study on "The Attitude of the American Federation of Labor toward Legislation and Politics."

First prize of $300 in Class B, open only to undergraduates, went to Paul T. Nutting, of Oberlin College, for his study on "Public Problems of Bituminous Coal."

Second prize of $200 was awarded to William John Schultz, of Columbia, for a study on "Six Years of Inflation," and Harry Nadell, of Harvard, gained honorable mention by an essay on "Conditions of Employment in the United States Postal Service."

The judges who passed on the merits of the manuscripts submitted were:

Professor J. Laurence Laughlin, of the University of Chicago.

Professor J. B. Clark, of Columbia University.

The late Professor Henry C. Adams, of the University of Michigan.

Professor Edwin F. Gay, former professor of economics and dean of the school of business administration of Harvard University and now president and editor of the New York *Evening Post*.

Former United States Senator Theodore E. Burton.

Illinois Gas Association Establishes Two Research Graduate Assistantships

(*Continued from page* 62.)

ization within the College of Engineering, was established in 1903 for the purpose of conducting investigations in the various branches of engineering, and for the study of problems of importance to engineers and to the manufacturing and industrial interests of the State of Illinois. Research work and graduate study may be undertaken in architecture, architectural engineering, mining engineering, municipal and sanitary engineering, physics, railway engineering, and theoretical and applied mechanics.

The work of the Engineering Experiment Station is closely related to that of the College of Engineering, and the heads of departments in the college constitute the executive staff of the station. Investigations are carried on by members of the station staff and also by members of the instructional staff of the College of Engineering.

Additional information may be obtained by addressing the director, Engineering Experiment Station, University of Illinois, Urbana, Ill.

Companies Merge and Reduce Rate

A reduction of 10 cents per thousand cubic feet in the price of gas, effective at once, was announced by the Peoples Gas Light Company, of Manchester, N. H., following receipt of a communication from the New Hampshire Public Service Commission enclosing articles of incorporation of the Manchester Gas Company, a merger of two existing Manchester organizations. The former price of gas in Manchester was $1.50 per thousand cubic feet. Arthur M. Heard, of Manchester, has been elected president of the new corporation, with Thomas R. Varrick, vice-president, and Walter G. Africa, treasurer.

William H. Bradley, Chief Engineer of Consolidated Gas Company, Drops Dead in Office

William H. Bradley, chief engineer of the Consolidated Gas Company, died suddenly of heart failure Jan. 18, in his office in the gas company's building, No. 130 East Fifteenth Street. He had been chief engineer of the company thirty-six years. Mr. Bradley s body was removed last night to his residence, No. 23 West Sixty-eighth Street. It was only a few days ago that he expressed a desire to "die in harness." Mr. Bradley had lived a very active life and had been the chief moving spirit in many very large construction engineering propositions. Although eighty-four years old, he was a daily visitor to his office, where he took delight in studying plans and watching the daily details of the manufacture of gas, and its distribution. Ten days ago Mr. Bradley, accompanied by several officers of the Consolidated Gas Company, visited the works of the Astoria Light, Heat & Power Company, at Astoria, Long Island, where he turned the large bar that started the flow of gas into the newly completed 15,000,000 cu. ft. gas holder. This was the second holder of that capacity that Mr. Bradley had seen completed on plans and specifications prepared by himself.

Walter L. MacIntosh, the gas ocmpany's chief draughtsman, entered Mr. Bradley's private office shortly after four o'clock Wednesday afternoon to discuss a drawing with him. Mr. Bradley was just entering his office from an adjoining office room, carrying a small glass of water in his hand. He seated himself at his desk and began to talk to Mr. MacIntosh about his wireless apparatus at his home and pointed to a piece of mechanism that he was going to take home with him in a few minutes to attach to his wireless. He said that his daughter had called him a few minutes before and had spoken about concert music that she had heard over his wireless apparatus. Mr. Bradley then closed his eyes, and Mr. MacIntosh asked him, "Chief, don't you feel well?" There was no reply, and Mr. MacIntosh got up from the chair in which he was sitting, picked up one of Mr. Bradley's telephones, and called Mr. William Cullen Morris, engineer of construction, whose office is on the same floor. Mr. Morris was at Mr. Bradley's side in a few seconds and, realizing the situation, called for Dr. Robert L. Irish, of No. 120 East Seventeenth Street. Dr. Irish appeared promptly and pronounced Mr. Bradley dead. Word of the death of Mr. Bradley was immediately communicated to George B. Cortelyou, president of the company, and Vice-Presidents Walter R. Addicks, Robert A. Carter and Charles G. M. Thomas, and to the heads of departments, who remained at the building until Mr. Bradley's body had been transferred to his home.

William H. Bradley was born in New Haven, Conn., on Aug. 25, 1838. He was the son of Charles and Sarah Stanley Bradley. He received a common-school education and for several years, while still a resident of New Haven, he served in the mechanical department of a large manufacturing establishment. It was while living in New Haven, in 1859, that he married Elizabeth Whitlock, who survives him. He was then twenty-one years old, and shortly after his marriage he entered the service of the Continental Iron Works, Brooklyn, N. Y., as construction engineer. At that time that company was actively engaged in the execution of large governmental contracts, among them, in 1862, Ericsson's Monitor, and Mr. Bradley took an active part in the building of that new warcraft, which subsequently met and defeated the Merrimac. While the Monitor was being built, Mr. Bradley criticised some parts of the plans, which criticism subsequently proved to have been well founded. Mr. Bradley remained with that company until the close of the war, when he became interested in the discovery of oil in Western Pennsylvania, which took him to that State, and there he established a machine and boiler shop and engaged in the manufacture of oil well drilling tools. He came back to New York City in 1870 and again became the construction engineer of the Continental Iron Works, taking charge of the gas plant and gas holder department, planning, superintending and erecting gas plants in various parts of the country. One of the gas plants built under his supervision was that of the municipal gas works in West Forty-fourth Street, New York City and, after the completion of those works in 1876, Mr. Bradley remained with the Municipal Gas Light Company as its engineer, at the same time acting as the engineer for the Metropolitan Gas Light Company.

The Consolidated Gas Company was incorporated in 1884, and two years later Mr. Bradley became chief engineer of the newly formed company. In the late 70's Mr. Bradley became convinced that the illuminating power of coal gas could be greatly increased by the infusion of oil. At that time the Standard Oil Company was disposing of immense quantities of an oil for which no use had been found. Mr. Bradley called on Henry H. Rogers and asked him if he could have the use of some of that oil that was being thrown away. He explained the experimental use to Mr. Rogers, who told Mr. Bradley to take all he wanted. Mr. Bradley took this oil up to one of the old gas works and there experimented not only in enriching coal gas with it, but also what is known to-day as carbureted water gas. His experiments having been successful, Mr. Bradley made a contract with Mr. Rogers, whereby he purchased the oil for one cent a gallon. This oil subsequently became known as naphtha and later as gasoline. The price of the oil, because of its many uses, jumped to a figure that made it impossible to use it for gas-making purposes, and in its place to-day gas oil is used.

Mr. Bradley on entering the employ of the Consolidated Gas Company of New York, made an extended trip in Europe, where he studied the gas plants in various countries, and on his return made an extended report on all the properties of the Consolidated Gas Company and policies for future guidance to meet the phenomenal growth of this city. His survey of the city led him to report that the time would come when the manufacture of all the gas necessary for the city would have to be made in some other place than on Manhattan Island. Two or three

properties were called to his attention, and he selected the present site of nearly 400 acres at Astoria, Long Island, where the Astoria plant, the largest in the world, is now in operation. That plant, which has a daily capacity of 86,000,000 cu. ft. of gas, was constructed under the plans and specifications in every detail as Mr. Bradley had planned. The equipment of the retort houses, the scrubbers, the tar extract houses and coal handling apparatus, as they are today, were all designed by Mr. Bradley.

Mr. Bradley leaves a wife, a daughter, Miss Bessie Bradley; two sons, George Bradley, assistant engineer of the Nevins Street plant of the Brooklyn Union Gas Company, and Charles W. Bradley, gas engineer of the Peoples Gas Light & Coke Company, Chicago, Ill. Mr. Bradley was the past master of Greenpoint Lodge No. 403, F. and A. M. He was president of the American Gas Institute in 1909 and 1910, and a member of numerous technical gas association and societies.

John West, Pioneer of the Gas Industry Dies at the Age of 86

We regret to announce the death of John West, of Messrs. West's Gas Improvement Company, Ltd., Manchester, England, which took place at his home in Southport on the thirteenth of the month. Mr. West, who was in his eighty-sixth year, was one of the pioneers of the gas industry and by his achievements was well known on both sides of the Atlantic.

A very energetic man, as late as 1917, before the Southern Association of Gas Engineers and Managers (England), he read one of the outstanding papers that has been presented on the subject of increased makes obtainable by steaming in vertical retorts.

In his early years he was engineer of the Maidstone, Gas Works, Kent, and prior to his development of the Glover-West system of vertical retorts had been engaged for forty years in building horizontal retort plants, charging and discharging machinery, etc.

Mr. West, Sr., had been in failing health during the last two years and it was with some misgivings on this account that Fred West visited the States in November on business connected with the American firm and to attend the Chicago convention. Besides Fred West, two other sons, Frank and Ernest, are engaged in the management of the works founded by their father.

Making Satisfied Gas Customers

(*Continued from page 57.*)

surely you can find a way to offset just what is mentioned herein; that is, invite gas users to call upon you for help in their cooking utensil problems and while there may be a little expense to start with, you should within a short time increase your business sufficiently to justify the venture.

Placing hypothetical questions and answering them may shoot wide of the mark and consume too much space, but specific problems can and must be met by specific means.

Let's go.

The Benefit of Natural Gas

Mention having been made that it was likely Denver would be served with natural gas piped from Wyoming, many folks have found cause to "sit up and take notice."

No doubt what is proclaimed as a resultant good for one town will in the main apply to other towns. Therefore it is heartening to pass along statements from prominent manufacturers relative to the glad tidings that Denver City may have natural gas.

W. J. H. Doran, president of the Colorado Manufacturers and Merchants Association, said:

"Cheap natural gas for Denver will double the population of the city in ten or fifteen years. The city's industrial future should be assured if the project goes through. The present wholly inadequate artificial gas supply in Denver has had a tendency to stifle the growth of industry. It was not long ago that representatives of the gas company called at our coffee-roasting plant and suggested that we put in grates and prepare to use coal and coke in case the company should be unable to supply us with all the gas we needed. Fuel, especially gas, is the all-important factor in many industrial manufactories. It is highly important in foundries and factories using blast furnaces. Gas is more sanitary than coal, and indispensable in many plants."

Charles G. Gates, president of the Gates Rubber Company, said:

"I believe the plan to bring natural gas here is an excellent thing, if the proposal is feasible and the price of gas will be substantially lower than present charges. There is no question but that the present supply of gas is absolutely inadequate for our needs. The cost of power is one of the most vital matters considered by persons desiring to establish industries. For instance, in the manufacture of glass, gas only is used.

"I certainly hope that the gas company will be able to put through their plans to bring the natural gas from Wyoming into Denver."

Many readers of the AMERICAN GAS JOURNAL will recall that the Denver Gas Company not long since stated that they must spend $2,000,000 to rehabilitate their present artificial gas plant and now those plans have been drawn, but if the natural gas alluded to is brought in, there will not be any enlargement of the old plant necessary.

When all of these things are considered, there does not seem to be any logical reason why the thing should not become a reality and all Denver is hoping that it will prove real.

Boston Consolidated Plans Merger

The Boston Consolidated Gas Company has filed a petition with the Department of Public Utilities at the State House, Boston, Mass., for merger with the East Boston Gas Company and the Newton & Watertown Gas Light Company. A hearing on the petition has been set for January 19. The petition said that the proposed merger had been approved by a two-thirds vote of stockholders, as required by law.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	Jan. 19, 1922 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	96	97
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	89½	90
Columbia Gas & Elec. Co.	First 5s	May 1, 1945	88	89¾
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	105	107
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	83½	84
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	104	104½
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	72	75
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	85	88
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	95	97
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	96	98½
Hudson County Gas Co.	First 5s	Nov. 1, 1949	85	88
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1943	87½	89
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	98	100
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	85	88
Milwaukee Gas Light Co.	First 4s	May 1, 1927	89	91
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	88	88½
Pacific Gas & Elec. Co.	Col. Tr. Conv. 7s	May 1, 1925	100½	101
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	105	106
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	93	95
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	85	86
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	91	92½
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	86	89
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	78	82
Southern California Gas Co.	First 6s	Nov. 1, 1950	94	98
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	83	86
Washington Gas Light Co.	General 5s	Nov. 1, 1960	89¾	91
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	85	87

Bond Issue

New York, N. Y.—An interesting public utility issue is the Standard Gas & Electric Company's debenture 6s, due in 1935. In recent years they have been distributed widely throughout every State in the Union. They yield about 7.90 per cent at their current prices and are direct obligations of the company, but not secured by a mortgage. They are well provided for, however, and earnings applicable to interest on the issue were about four and four-tenths the amount required in the last year. The company is a holding company and owns bonds, stocks and other securities of thirteen public service corporations in various parts of the country and serving 463 communities with a total population of approximately 2,270,000. All the company's bond issues are secured by pledge of collateral of its subsidiaries. After deducting the amount of collateral behind the company's secured bonds there remains collateral with a value of $34,000,000 to protect the $12.500,000 of its debentures outstanding. The debentures are redeemable on any of their interest dates at 103 and interest. They are obtainable in denominations as low as $50. The combined gross earnings of the company's subsidiaries in the year ended with Sept. 30 were $34,757,764, in contrast to $30,-809,762 in 1920, and its net earnings $11,863,442, in contrast to $11,-960,945 in the preceding year. About 84½ per cent of the company's revenue is derived from the sale of electricity.

Gas Company Stock Increased to $500,000

The Contra Costa Gas Company has filed a copy of amended articles of incorporation increasing the capital stock of the company to half a million dollars. The capital stock of the concern when the company was organized, was $250,000.

The Contra Costa Gas Company was established seven years ago and serves the towns of Antioch, Pittsburgh, Bay Point, Concord Pacheco, Martinez, Port Costa and Crockett.

There will be 5,000 shares of stock out when the new issue has been sold.

Asks Leave to Sell Stock

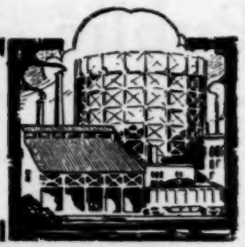
Boston, Mass.—The Lowell Gas Light Company has petitioned the Department of Public Utilities for permission to sell at not less than $150 a share, the price fixed by the commission, 1,470 shares not subscribed for by stockholders at the offering made pursuant to the order of the commission dated April 30, 1920. The unsold stock is part of an authorized issue of 2,000 shares.

Gas Rate at Oilton Ordered Increased

Oklahoma City, Okla.—The Oilton Gas Company was authorized in an order issued by the State Corporation Commission to put into immediate effect an increase of 13 cents for 1,000 cu. ft. for domestic gas.

The order was based on the recent increase in the city gas rate allowed the Oklahoma Natural Gas Company by the United States District Court. The commissioner's order provided that a bond be made by the Oilton company to cover possible refunds.

NEWS OF THE GAS INDUSTRY



Gas Company Celebrates Eightieth Anniversary

On December 28 eighty years ago the first gas lights were lit in the city of Toronto, Canada. To celebrate the event the Consumers' Gas Company announces that a reduction in the price of gas will be made to its customers early in the new year, should conditions continue to warrant a cut. The amount of the reduction and the form it will take have not yet been decided upon.

When the Consumers' Gas Company first took over the lighting system in Toronto in 1848 from Albert Furness, Toronto citizens had been using gas for lighting purposes for seven years. There were 817 customers on the company's books, and there were 164 street lamps in the city. The output was 5,834,000 cu. ft. of gas and the price was $5 per thousand feet.

To-day the company has more than 128,000 customers, and the output is over five thousand million cubic feet of gas per annum.

Fix 30-Cent Rate for Industrial Gas

Charleston, W. Va.—The Hope Natural Gas Company can charge 30 cents a thousand cubic feet for all gas used for industrial purposes, under an order issued by the Public Service Commission, making this rate effective from Jan. 1. The action was taken on a petition of the company to be allowed this rate, the petition being one substituted for its original request that the rate be 35 cents.

A dozen or more purchasers of gas for industrial use protested when the first petition was filed, but all but one withdrew this protest by agreement when the 30-cent rate was substituted. The only remaining protest was by the Bowers Pottery Company.

Rates were formerly 28 cents per thousand for the first 500,000 cu. ft., and 23 cents for all above that amount. The finding of the commission, after rejecting some of the items claimed by the gas company in determining valuation, held that it had been shown that "the percentage of the total expenses assignable to the applicant's gas service was greater than the percentage of total revenue derived from the sale of industrial gas." The commission found that the rate of 30 cents was just and reasonable.

Gas Company Stands to Lose

Enid, Okla.—The Oklahoma Gas & Electric Company stands in position to take a huge loss as a result of the recent action of the Federal court in granting an injunction against the State Corporation Commission, says Lincoln Beerbower, manager of the Enid division.

Under the Federal court ruling, the gate rate was increased from 25 to 35 cents while the company, believing that the matter would be settled definitely on Jan. 3 refused to take advantage of the corresponding increase of 13 cents which would have brought the domestic rate to 48 cents.

With the postponement Jan. 3 by the Federal court, the Oklahoma Gas Electric Company is furnishing gas at an actual loss in the city, according to Beerbower, who says the company stands to take a huge loss if the matter is not definitely settled soon.

Leakage, bad bills and distribution costs are a great deal more than the 10 cents now being charged, Beerbower says, and this is the amount now being paid by the public.

Bids Called for

The City of Seattle is calling for bids on $1,005,000 municipal light and power bonds to mature at the rate of $67,000 annually from March 1, 1928, to March 1, 1942. Bidders are asked to name the interest rate, not to exceed 6 per cent. These bonds are part of the authorized issue of $1,755,000 in 1918.

Appliances to Be Exhibited at "Own-Your-Home" Exposition

A full-size model home, completely furnished and equipped, all ready to move into, is to be erected as a feature of the fourth annual "Own-Your-Home" Exposition, to be held in the 69th Regiment Armory, New York, N. Y., April 22 to 30, and known as the "Beautiful Home Convenient." This announcement was made by William M. Crane, president of the William M. Crane Company and chairman of the gas appliance committee of the "Own-Your-Home" Exposition, at a meeting of this committee to discuss the participation of the gas industry at the exposition.

"The model home will be thoroughly piped and wired, and fitted with all the newest gas and electrical appliances and labor-saving devices which should be included in an up-to-date home no matter how modest its cost," said Mr. Crane. "The gas and electrical industries are going to see that nothing will be omitted in making this house appealing to the thousands of New Yorkers who will visit the exposition. The gas appliance committee will direct the policy of all gas exhibits on the exposition floor, and insist that they be in educational form. The committee will also see that every division of the gas industry created by the use of gas in the home is properly represented at the exposition and will take charge of all matters pertaining to general policy, publicity and the repute of concerns desiring to exhibit. Incinerators, gas lighting fixtures, mangles, dryers, gas radiators, gas irons and water heaters are among the appliances deemed desirable to include.

"The following assignments in the 'Beautiful Home Convenient' have already been made: General Gas Light Company, 'Radiantfire' gas heater; Ruud Manufacturing Company, gas water heater and incinerator; Consolidated Gas Iron Com-

pany, gas iron, and the William M. Crane Company, gas stove. Assignments for the fixtures, radiators and all other appliances will be made at a later date. Unless more homes are built, less piping will be run and the sale of appliances limited. We therefore feel that we owe our heartiest co-operation to this drive for the resumption of home building. It is up to us to convince the public of the necessity of proper wiring and adequate outlets. The sale of appliances will then be increased extraordinarily."

The members of the gas appliance committee include the following: Louis Stotz, secretary-manager, the American Gas Association; M. C. Robbins, president, the Robbins Publishing Company, Inc.; R. A. Bartholomew, the Ruud Manufacturing Company; W. A. Buerkle, the W. A. Buerkle Sales Corporation; George W. Byrnes, manager, the Manhattan Gas Heating Company; Harold E. Humphrey, the General Gas Light Company; H. J. Long, the Kompak Company, New Brunswick, N. J., and C. W. Wardell, the Welsbach Company, Gloucester, N. J.

Proposed Gas Financing

The San Diego Consolidated Gas & Electric Company has asked the Railroad Commission for permission to issue $1,500,000 par value of its first and refunding 6 per cent bonds, to be sold at not less than 93 per cent of their face value.

The company also asks authority to sell $378,600 of its preferred stock, with the provision that not to exceed 5 per cent of its face value may be used in connection with the expenses of sale.

The San Diego Consolidated further seeks the option of selling its common stock at not less than par, in place of all or part of the preferred stock, the total amount, however, not to exceed $378,600 of both kinds of stock.

The company told the commission that the construction expenditures against which it seeks authorization to issue the securities are for the most part future expenditures, and it asks to be permitted to use each month an amount equivalent to its allowable construction expenditures for the preceding month. The company states that it will file with the Railroad Commission each month a full statement of its construction expenditures for the preceding month, showing the amount to be withdrawn.

No Conflict in Two Rulings on Service Charge

Rochester, N. Y. — Newspaper dispatches have indicated that the appellate division, second department, has upheld the legality of the service charge as imposed by gas and electric corporations. In the case against the Rochester Gas & Electric Corporation the appellate division, third department, sitting in Albany, declared that the service was illegal in a proceeding instituted by Corporation Counsel Pierce. Since the authority of the four departments of the appellate division is the same, much interest was manifested in the supposedly conflicting decisions.

John A. Barhite, former public service commissioner, looked into the matter and found that the appellate division, second department, did not uphold the legality of the service charge, but simply refused to pass upon the matter because of the way in which the question was presented.

When he was a member of the Public Service Commission a minority opinion was written by Mr. Barhite in the Rochester proceeding, holding that the service charge was illegal. This opinion was upheld by the appellate division, third department, and Mr. Barhite says the second department has not changed the ruling in any way. The matter will be reviewed by the court of appeals, the highest tribunal of the State.

The action came before the appellate division, second department, in the case of the town of North Hempstead which appealed from an order of the supreme court of Nassau County denying a motion for an injunction to restrain the collection of the service charge. The City of New York was represented in the proceedings by John P. O'Brien, corporation counsel. The action was directed against the Public Service Corporation of Long Island. The opinion was written by Presiding Justice Blackmar and was concurred in unanimously.

The opinion is as follows:

The court at special term denied a motion for an injunction pendente lite. The plaintiff sought the injunction to restrain the defendant gas company from making a "service charge." This service charge has been authorized by a decision of the Public Service Commission, which has general jurisdiction over the matter of rates and charges of gas companies. There exists, however, in the transportation corporation law a provision prohibiting any gas light company from charging or collecting any rent on its gas meters, either in a direct or indirect manner. The plaintiff claims that the service charge is indirectly a rental upon gas meters and that therefore the Public Service Commission had no jurisdiction to authorize the defendant to make it.

It appears in the record that in the computation of the service charge and the statement of the elements that enter into it the Public Service Commission excluded interest and depreciation of meters on the ground that that might be construed as an illegal charge for "meter rental." It therefore appears that he Public Service Commission decided as a fact that the service charge was not, directly or indirectly, a charge for the rental of the meter. The decision of the Public Service Commission is subject to review by certiorari, in which the record of the evidence taken before the commission can be brought before the courts.

Kempster Elected New Gas Director

New Orleans, La.—A. L. Kempster, general manager of the New Orleans Railway & Light Company, and the New Orleans Gas Light Company, was elected to the board of directors of the gas company at the annual meeting. He replaces J. S. Bleecker, former manager of the railways company, and later connected with the Myles Salt Company.

According to Secretary Joseph H. DeGrange, Mr. Bleecker's name was dropped from the directorate upon receipt of a letter stating he would leave the city shortly.

D. D. Curran, J. D. O'Keefe, Frank B. Hayne, Lynn H. Dinkins, J. H. DeGrange and R. W. Wilmot were re-elected to the board. The annual election of officers will be held Feb. 6 Present officers of the Gas Light Company are J. D. O'Keefe, president; Frank B. Hayne, vice-president; Joseph H. DeGrange, secretary; H. A. Ferrandou, treasurer; H. Generes Dufour, counsel; A. L. Kempster, general manager; A. E. Merchant, general superintendent.

Tampa Gas Company Is Repairing Building

Tampa, Fla.—Work of repairing the damage to the Tampa Gas Company building, Madison and Tampa Streets, caused by fire, was begun last week. A $20,000 building permit was issued for the work, but Manager Roscoe Nettles, of the gas company, said that an error had been made, and that a new permit for a smaller sum would be taken out. He estimated the cost of repair to the building and offices on the second floor, which were damaged, between $10,000 and $12,000.

The fire did not cause any of the business establishments or doctors' offices in the building to close.

May Build Gas Line to Monroe, La.

Monroe, La.—Steps have been taken by officials of the El Dorado Gas Company to make a preliminary survey and ascertain the approximate cost of a pipe line to be built from the Monroe gas field to El Dorado to supply that municipality with gas. Representatives of the company have for some time been gathering data in Union and Morehouse on a proposed line, but so far as known no offers have been made with Louisiana gas well owners for a supply of gas.

Representatives of the El Dorado Gas Company have asked the El Dorado city council to amend the franchise whereby there would be an increase of 25 per cent in gas rates. If the franchise be granted, the company will take steps to build this line and secure gas from the local field.

It is said that the company has not definitely decided where its gas supply will be secured, as it may be obtained from Ouachita, Morehouse or Union Parishes, but it is generally believed here that the company, if it definitely concludes to build, will construct the pipe line from the gas producing areas of Union Parish, as a line from Union to El Dorado would not be more than sixty miles long.

Gas producers of the Monroe field say this line will cost not more than $1,000,000 and it might be possible to build it for $10,000 a mile.

The manufacturing plants at El Dorado depending on gas for fuel and power have been shut down for twenty or more days, according to reports received here, because of an inadequate gas supply. Domestic consumers are also short of gas.

The gas supply of the El Dorado field is rapidly diminishing, largely because the gas is being used by the oil companies for operations. The supply for El Dorado cannot possibly last more than ninety days, or four or five months at the outside, according to reliable reports from there.

On this account the El Dorado Gas Company is endeavoring to get an increase in its rates to justify building the pipe line. The company asks for the right to charge 75 cents per 1,000 cu. ft. for domestic purposes instead of 50 cents as at present and it is stipulated that the company cannot charge more than 25 cents for industrial purposes, but may charge less if desired.

"Ready-to-Serve" Charge Is Approved by Commission

Columbus, Ohio.—The "readiness-to-serve" charge of natural gas companies as a desirable and suitable method of distributing additional costs of giving service was once discussed by the State Public Utilities Commission in a decision in a case brought before the commission by the Ashtabula Gas Company. It says:

"There is much to be said in favor of a minimum or readiness-to-serve charge, and it has been recognized by the courts and commissions of several States, and experience has shown that it is not the poorer class who usually demand the connection and then fail to use the service, but the well-to-do, who have other means of supply and desire the connection only that they may be prepared for emergencies.

"There is a certain amount which the public must pay to enable the utility to operate. If a portion of it is paid in a readiness-to-serve charge, that much less is necessary to be produced from the sale of gas. The readiness-to-serve charge does not yield the company any greater sum, nor cost the consumer any more money. It results only in a different distribution of the burden. It would seem that any one demanding the service should pay at least a sum equal to a fair rate of interest on the 'bare bones' of the investment, whether he uses any gas or not."

Notice of Stockholders' Meeting

San Diego, Cal.—Notice is hereby given that the annual meeting of the stockholders of San Diego Consolidated Gas & Electric Company will be held at the office of said company, 935 Sixth Street, in the city of San Diego, County of San Diego, State of California, on Tuesday the 24th day of January, 1922, at 10 o'clock A. M. of that day for the following purposes, to-wit:

1. The election of directors for said company for the ensuing year and to hold office until their successors are elected and qualified.

2. To consider and vote upon the question of authorizing the board of directors of said company to amend the articles of incorporation of said company so as to show the number of directors of said company as increased by the written assent of the holders of a majority of the subscribed and issued capital stock of the corporation.

3. To transact all such other business as may legally come before the meeting, including the approval and ratification of all actions of the board of directors since the last annual meeting of the stockholders of the company.

Dated at San Diego, Cal., this 24th day of December, 1921.

M. B. Fowler,
Secretary.

Water, Heat and Light from a Single Drilled Well

Buffalo, N. Y.—Water, heat and light from a single well less than 250 ft. deep has made John Schaeffer, an Alleghany County farmer, envied by his neighbors. When Schaeffer hired drillers to sink the well, he was after water. The workmen tapped a considerable pocket of gas and a gas pipe was run down beside the water pipe. The gas has continued to flow steadily.

Treasury Reimbursed

San Francisco, Cal.—By a supplemental order of the Railroad Commission, the Southern California Gas Company has been authorized to use the proceeds obtained from the sale of $119,000 of first and refunding mortgage bonds to reimburse its treasury in part and to finance the cost of extensions, additions and betterments.

Notes of Investigations by United States Bureau of Mines

A study of the unsaturated hydrocarbons in industrial gases is being made by the Bureau of Mines with a view to developing economic methods for the manufacture of alcohols from them. Ethyl and propyl alcohols in particular are being sought. Gas distilled from a mixture of oil and coal is at present being studied in cooperation with the Trent Process Corporation, of Washington, D. C.

The universal gas mask has been fully developed for protecting the wearer against all poisonous gases not exceeding 2 or 3 per cent concentration in air where a safety lamp will burn, the flame showing that enough oxygen is present to support life. Universal gas masks weigh 8 1/3 pounds and give a maximum time of protection. A fireman's gas mask has also been developed which has a smaller canister, weighs only 5½ pounds, is less cumbersome than the universal mask, but has a shorter life. Tests of the universal mask are being made in actual use, after which complete specifications will be given. At the request of the Navy Department the navy gas masks have been tested by the Bureau of Mines for protection afforded in fire fighting.

In the study of the distillation of Freeport coal being made at the Pittsburgh Experiment Station of the United States Bureau of Mines, duplicate samples of the bone and cannel constituents of the Freeport seam have been distilled at low temperature in twelve-pound lots. A sample of the bottom section of the clean coal was also distilled. From a comparison of the yields it would seem that the bone and cannel constituents of this seam should be of too great value to be treated as refuse.

At the Pittsburgh Experiment Station, in connection with the investigation of coal-storage problems, coal has been exposed to excess air for three hours at 150 deg. Cent.; the amount of oxidation products formed and the amount of oxygen absorbed are taken as a measure of the tendency of the coal to ignite spontaneously. The method has been tested on Newfield (Freeport) coal and Texas lignite with fairly consistent results.

The report of the investigation made by the Bureau of Mines at the Pittsburgh Station, relating to the value of coke, anthracite and bituminous coal for the generation of steam in the low pressure cast iron boiler, is being prepared for publication at a later date. The report shows the relative steaming values of the fuels and why the thermal efficiency varies with the different fuels. The draft required with the various fuels is carefully analyzed.

At the Central District Station of the Bureau of Mines at Urbana, Ill., laboratory work on the distribution of sulphur forms at certain mines in the Illinois No 6 bed has been completed. Sulphur forms have been determined in the raw coal, clean coal and refuse resulting from washing this coal on the S. S. & S. table at Dallas and on specific gravity fractions.

Frederic E. Gunnison Dies

New York, N. Y.—Frederic Everest Gunnison, 52, banker and lawyer, died in the Peck Memorial Hospital, Brooklyn, Jan. 11. He was born in Canton, N. Y., and was educated at Columbia and New York Universities. He was admitted to the New York bar in 1892, and later became vice-president of the Lawyers Title & Trust Company. He was a director in the Chase Securities Company of New York, the Queens County & Suburban Railway Company, the City of New York Insurance Company and a number of other corporations.

He was appointed chairman of the gas and electric light commission formed during the administration of the late Governor Higgins, and retained this position until the commission was merged with the Public Service Commission formed during the administration of Governor Hughes. During the war, he was Federal coal administrator for Brooklyn.

THE PACIFIC GAS & ELECTRIC COMPANY is reported to have placed its advertising account for 1922 with the affiliated agencies of K. Leroy Hamman, Oakland, and Johnston-Ayres, San Francisco, Cal.

Referendum Is Denied by Decision

Cincinnati, Ohio.—Holding that he is bound by the decision handed down in 1917 by the late Judge Howard C. Hollister of the United States District Court, Common Pleas Judge Edward T. Dixon has handed down a decision refusing to grant the injunction asked for by Eli G. Frankenstein, as a taxpayer, to prevent the Union Gas & Electric Company from putting into effect the new rates for gas, pending a vote upon the referendum proposed against the new gas rate ordinance, and which is sought to be held next August.

The decision also holds that the ordinance is not one subject to the referendum, Judge Dixon declaring that he is bound by the decision of Judge Hollister, a court of equal jurisdiction on the subject matter, the decision in that court never having been appealed to the higher courts.

Judge Dixon admits that his opinion upon the question does not coincide with that of Judge Hollister, but he is bound by the rule of res adjudicata and must follow that decision, and he urges that the present suit be prosecuted to the highest tribunal in order that a final determination of the question may be had.

Judge Hollister's holding was that when the gas company was granted a twenty-five-year franchise in December, 1905, which provides for regulation of rates from time to time, the statutes of Ohio at that time were read into the contract, and the franchise contract must be construed upon them, and not by subsequent legislation, such as the initiative and referendum law, which was not passed until 1912, nor could these subsequent laws impair that contract of 1905.

"Whether this was right or wrong, I am bound by Judge Hollister's ruling, and this court must follow that decision until some decision of a higher court has been obtained," Judge Dixon said.

Under the decision of Judge Dixon the new rates for gas go into effect as from Jan. 1, unless Frankenstein's appeal, of which he gave notice, for a temporary restraining order is granted, pending review by the Court of Appeals.

No matter what steps are taken, a decision upon the question of the right of the referendum upon the ordinance must be obtained by the highest court, it is declared. If Frankenstein takes his case up, and he has thirty days' time in which to

file an appeal, the question of referendum will be decided through it, and if the upper courts determine that the referendum can be held, it will be voted upon at the primary election next August.

In the interim, however, the gas company, unless stayed by an injunction of the upper courts in Frankenstein's suit, will proceed to charge and collect the increased rates, and, in the event that the referendum is upheld and succeeds in producing reduced rates, the company will have to refund the difference upon its collections.

Rate Commission Investigates Gas-Making Costs

Madison, Wis.—Operating costs of gas companies are not at the prewar level, and therefore rates cannot be reduced to those levels, as many people seem to believe, declares the Railroad Rate Commission in a decision in which it uses the Stoughton Light & Fuel Company as a specific and typical case in point.

The commission, after an exhaustive investigation in this case, points out that the cost of the gas-making materials is still 113 per cent higher than in 1915, and that labor still represents an increase of 50 per cent in the cost of gas.

The findings of the commission follow:

"It is believed by many that the operating costs for such a utility as is under consideration are at the prewar level and that the rates for service must be therefore reduced likewise.

"In 1915 the total cost of all gas-making materials was $5,022, or 42.2 cents per thousand cubic feet sold. The estimated cost for these materials for the coming year was $13,723.50, or 68.2 cents per thousand cubic feet. That item of cost alone is still 113 per cent higher than in 1915.

"The total payroll amounted to $4,820.12 in 1915. At the present time the company is paying out for this purpose $9,180.36. The wages paid to the men making the gas at the plant used to be $1,465; now wages at the plant amount to $3,514 a year. In 1915 the total labor cost averaged 30.9 cents per 1,000 cu. ft., and at the present time the payroll averages 44.1 cents per 1,000 cu. ft., an increase of about 50 per cent in cost of gas."

Wherever the commission finds that revenues of a company are greater than the 7 or 8 per cent allowed under the law, rates are being reduced.

Saving of Gas Urged

"Natural gas, almost marvelous gift of nature, yet, alas, prodigal in its use, causes experts on every hand to fear exhaustion of the supply in the near future unless strenuous and effective conservation measures are adopted," declared Grover C. Maxwell, Cleveland, former secretary of the Public Utilities Commission of Ohio, in an address before the Rotary Club at the Hotel Sinton on "A Half Century Miracle."

"To the extent that the public understands the underlying facts and principles of the utility industry and the conditions under which they render service to that extent will equity and justice prevail in the public's regulation of their utilities, whether through their municipal authorities or their State commission," continued Mr. Maxwell.

"Some of these underlying facts are: That a public utility does not operate for profit, but seeks only a fair rate of return on the actual value of its property after paying operating expenses, depreciation and taxes.

"The Ohio commission has never allowed this rate of return in excess of 8 per cent—generally less; yet during the past few years many Ohio utilities have been compelled to pay in excess of 8 per cent for new capital to finance extensions and improvements rightfully demanded by the public.

"The people themselves are rapidly becoming the real owners of the utilities. In Ohio there are more than 130,000 stockholders, besides those who have an indirect financial interest through the ownership of utility securities by insurance companies and banks.

"The 'turnover' of capital is smaller in the utility industry than in any other business or industry. A merchant expects to turn over his stock several times a year, but with the public utility a single turnover is a matter of several years and an investment of from $3 to $5 must be made to secure $1 in gross revenue.

"There is great need that business men should interest themselves in the adjustment of public utility problems. There is great need that these problems be divorced in every way from political considerations. There is great need that less consideration be given political advantage and legal technicalities and more consideration given to sound common sense and business methods."

Experiments in the Use of Mixed Fuel

In Technical Paper 284, "Coal and Coke Mixtures as Water Gas Generator Fuel," by W. W. Odell, gas engineer, just issued by the United States Bureau of Mines, are given the details of studies recently made at Davenport, Iowa, in cooperation with the Illinois State Geological Survey and the Engineering Experiment Station of the University of Illinois, in which very satisfactory results were obtained with the use of coke and Illinois bituminous coal in the manufacture of water gas.

The scarcity of high-grade coke and the great rise in price of all grades of coke have made it almost necessary for some gas companies to consider the substitution of bituminous coal for coke as generator fuel, even though grave difficulties were expected in maintaining the capacity of the plant with the new fuel.

The experiments conducted at Streator, Ill., by the Bureau of Mines and the Illinois Geological Survey, in 1918, in operating a six-foot set six to seven hours a day did not solve some of the important questions in the use of coal fuel; namely, the effect of a stand-over period on capacity and possibilities in the use of the blow-run method of operating with mixed fuels, coal and coke. The chief purpose of the present paper, therefore, is to present information bearing on these problems and the results obtained during six weeks of experiment at Davenport, using mixed generator fuel with the blow-run method of operating. Data are included on the behavior of the various fuels used in the generator, the clinker conditions, the use of fuel high in ash, and on the use of coal high in sulphur.

Copies of Technical Paper 284 may be obtained by applying to the Bureau of Mines, Washington, D. C.

Novel Lighting Conference and Demonstration

Sandusky, Ohio.—A unique industrial and commercial lighting conference and demonstration was given in this city last week to show local merchants and industrial men the advantages of new systems of lighting. Exhaustive tests have shown that proper illumination is a big factor in increasing manufacturing production. lowering cost, bettering working conditions and, in the commercial lines in increasing sales.

The conference and demonstration was arranged by Sandusky Gas & Electric Company, with the Edison Lamp Works of the General Electric Company. The talks and demonstrations took place in a special portable room, formed from a framework of iron piping over the top and sides of which a canvas ceiling and walls had been placed. In this room within a room the "indoor tent," as it has been called, the audience sat and, as different systems of lighting were shown, by means of different kinds of lights and reflectors hung close to the canvas ceiling, each one of the audience was allowed to test the lighting intensitv through a device known as the foot candle meter.

Lecturers from the Edison Lamp Works accompanied the conference and demonstrated and talked on the effect of the different methods shown during the demonstration. The portable room seated about seventy-five people at a time.

The program for the commercial demonstration included modern store illumination, showing the various fixtures suitable for the lighting of the interior of the modern store; how they should be placed and used in order to increase sales; show-window lighting, giving by actual demonstration the proper fundamentals; how properly directed light in the show window makes stationary objects appear to move; colored light and how to use it in the show window with striking effects; color matching units. their function and how they can be used to advantage; the marvelous miniature show window designed by Berthold Audsley, the well-known model builder. This model window was one of the features of the show.

At the industrial demonstration the following subjects were discussed and demonstrated:

Increases in production that have been obtained through high intensity illumination; how good light decreases spoilage; facts on accidents and their prevention; how good lighting betters working conditions and assists in welfare work; complete discussion on the cost of lighting installations, showing clearly what results for a given expenditure the manufacture should receive.

How light affects speed of vision, demonstrated by G. H. Stickney's "Speed of Vision" apparatus; how light affects the ability to see detail; the effect of color of walls and ceilings on illumination; various lighting units; how they should be used, where placed, etc.

A large number of invitations were sent out by the Sandusky Gas & Electric Company.

Orders New Gas Rate

An order has been issued by the Illinois Commerce Commission to the Peoples Gas Light & Coke Company to establish on Feb. 1 a temporary rate of $1 per thousand cubic feet for gas. This is a reduction of 15 cents a thousand cubic feet for the average household consumer. The company is expected to appeal to the courts against the ruling.

Studying Industrial Conditions

Cincinnati, Ohio.—Dr. G. H. Van Hengel, 30, mechanical engineer of Rotterdam, Holland, is working as an oiler at Union Gas & Electric Company plant. Front and Rose Streets, to study industrial conditions in this country. He expects to spend several years in this country working in different capacities before he returns home. Labor, as a rule, is better paid than in Holland, he said.

Los Angeles Gas Stock

The Los Angeles Gas & Electric Corporation has applied to the Railroad Commission for authority to issue $2,000,000 of its preferred stock of the par value of $100 a share to be sold at not less than $85 a share. The proceeds are to be expended to meet in part the cost of additions and extensions planned for 1022. it is estimated that total expenditures for this purpose this year will be $7,835,410

Personal Notes

TOM ALLEN, formerly with the Staunton Gas Company, Virginia, has opened a sales office in Richmond, Va., for the Blue White Company.

THEODORE PFEIFFER, formerly director of publicity for the Louisville Gas & Electric Company, has joined the advertising department of the H. M. Byllesby Company, Chicago.

C. J. DURBAN, formerly advertising manager of the Detroit Stove Works, has joined the organization of the Favorite Stove & Range Company, Piqua, Ohio, as advertising manager and assistant sales manager.

LEWIS S. BAXTER has joined the salesforces of the Scott Gas Appliance Company, Inc., Washington, D. C., as field manager. Mr. Baxter does not need any introduction to the gas industry, as his activities in the field are well known.

H. M. BYLLESBY & Co. announce the appointment of Chester C. Levis as manager of all the company's Eastern offices with headquarters at New York City. Mr. Levis, who has been in charge of the New York office for three years past, will now have supervision over the Boston, Providence and New Haven offices which have heretofore been handled directly from Chicago.

THEO. P. PFEIFFER, for eight years with the Louisville Gas & Electric Company, has entered the Publicity Department of H. M. Byllesby & Co.

L. L. OSLER, for the past five years commercial manager of the Pacific Power & Light Company, at Yakima, Wash., has been appointed resident representative at Seattle, Wash., of the Northwest Gas & Electric Equipment Company, Portland, Ore.

GUY R. KENDALL, for the past ten years associated with the Portland Gas & Coke Company as assistant sales manager, has been appointed resident representative at Los Angeles, Cal., for the Northwest Gas & Electric Equipment Company, of Portland, Ore.

Gas Company Tells Story of Manufacture

Ord, Neb.—The new owners of the Ord gas plant have had an interesting story written about the manufacture of gas for lighting and cooking purposes. This story is published from time to time in a local paper. The first instalment, published recently, is as follows:

"First, it might be interesting to mention something about the early history of the local plant. About twenty-five years ago G. W. Milford & Sons installed for their own use in their store here an outfit for the manufacture of gas from gasoline for lighting purposes. This outfit they still have and used until a year or two ago. It made a good brilliant light but, of course, it was not suitable for cooking purposes.

"About twenty-two years ago they supplied gas to several of the business houses adjacent to them. It is very probable that this gas venture of theirs was the only gas business that really ever paid in Ord. The success of the plant induced several of the good old pioneers, namely: G. W. Milford, Peter Mortensen, W. W. Haskell, W. A. Anderson, C. E. Goodhand and others, to organize and incorporate the Ord Light & Fuel Company. They bought the present location and built the building in which the present plant is installed. The process of manufacture was from gasoline, the same as was the Milford plant. This was about the time when gas mantles came into use. The quality of this gas was excellent and it produced a clear, brilliant light.

"The plant enjoyed a good patronage and many of the best homes and nearly all of the buisness houses were piped for gas. Many of these homes still use gas in preference to electricity with its expensive glaring and flickering They find the gas much better to work by and easier on the eyes.

"However, after a few years of faithful service, the old gas plant was bought by W. W. Haskell, who remodeled the plant from the old gasoline system to the modern water gas method. To Mr. Haskell the community owes much for this as well as many other good deeds performed by this pioneer and for which he was not given enough credit. Had it not been for him, no doubt, we would still be using the dangerous old gasoline stove, the slow and smoky coal oil stove, or the dirty and very expensive old coal range."

The next instalment will tell of the manufacture of this modern water gas which, for lighting and cooking, is the quickest, cleanest and cheapest plan ever yet devised.

Ohio Gas Case Set for Feb. 27

Washington, D. C.—The Supreme Court has ordered a reargument of the West Virginia-Pennsylvania-Ohio gas cases on Feb. 27 with special reference to several of the questions involved.

The questions which the court indicated it desired emphasized in the reargument are whether the suits were not prematurely brought as no action has been taken either by the States or by the State commissions under the statute, and whether the cases present a cause justifiable between the States, parties to the action.

The dependency of the State of Ohio on its supply of natural gas was painted in vivid pictures before the United States Supreme Court by Attorney General John G. Price of Ohio.

The future prosperity, welfare and health of the inhabitants of 300 Ohio cities and towns, which are supplied by natural gas from the fields of West Virginia, depend upon a continuance of that supply, Price told the court.

Unless a permanent injunction against the Steptoe act is granted, all natural gas produced in West Virginia will be consumed within that State by industrial concerns and households before the domestic users of Ohio, Pennsylvania and other States can obtain a foot, Price declared.

He told the court that 4,000,000 persons in Ohio—three-fourths of its population of 5,750,000—would be cut off from the use of natural gas. He said there are about 650 towns in five States entirely dependent upon West Virginia gas, distributed as follows: Ohio, 300; Pennsylvania, 300; Kentucky, 25; Indiana, 15, and Maryland, 14.

"Fifty per cent of the natural gas consumed in Ohio is imported from West Virginia," Price said.

Cut Salaries in Utica

The Utica Gas & Electric Company, of Utica, N. Y., has served notice on all employees that salaries will be cut 12½ per cent, effective Feb. 1.

San Joaquin Power to Issue New Stock

San Joaquin Light & Power Corporation has asked the Railroad Commission for authority to issue $5,000,000 7 per cent cumulative prior preferred stock.

The company proposes to make immediate large expenditures in hydro-electric development and in the extension of its distribution and transmission lines.

The commission was also asked to approve an agreement entered into with Cyrus Pierce & Co. for the sale of $3,000,000 of the proposed issue at $92 a share to the bond house.

Gas Company to Make Refund

Lincoln, Neb.—A refund in the sum of $284,000 will be paid patrons of the Lincoln Gas Company. The money is in rebates to gas consumers who have for several years been paying in excess of a dollar a thousand, the rate fixed by city ordinance.

The case has been fought in the courts until the United States Supreme Court recently affirmed the contention of the city.

Peoples Gas

Chicago, Ill.—In its brief the Peoples Gas Company attorneys place the cost of gas production at 88.31 cents during October. The city contended that for 1922 cost would be only 78.06 cents. The present rate of $1.15 was fixed when company cost was set at 96.16 cents. In September, 1920, the company contends cost was $1.0543.

Standard Gas Earns More

The Standard Gas & Electric Company reports for the twelve months ended Nov. 30, 1921, including its subsidiaries, operating revenues amounting to $34,843,844, which is an increase of $2,999,556, and net income of $12,126,080 (excluding revenues collected for other producing companies) an increase of $1,021,754.

Cut in Quality Opposed

St. Louis, Mo.—The Woman's Chamber of Commerce has adopted a resolution opposing the application of the Laclede Gas Light Company to be permitted to reduce the quality of gas served in St. Louis from 600 to 570 B.t.u. per thousand cubic feet.